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A Paper ON FILTERABLE VIRUSES AND PRACTICAL MEDICINE.*

BY

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I APPRECIATE the invitation to open this discussion, not as a personal honour, but rather as a compliment to the laboratory worker, and an instance of that spirit of co-operation between the two branches of medicine—clinical and scientific—which is daily becoming more intimate and consequently more fruitful. There is one point that I should like to bring into prominence. The clinician, faced as he is daily with the vital problems of disease, should be, and often is, one of the great initiative forces in research. Since my appointment to a research post at the London Hospital I have come to realize how stimulating a close contact with the clinical side of medicine can be to the laboratory worker. But for this to be effective the clinician must have some conception of the lines along which the pathologist is thinking, and I feel, rightly or wrongly, that many clinicians may be out of sympathy with investigation in the field of filterable viruses as suggesting too much of what is termed academic research. I therefore welcome the opportunity of describing some aspects of recent work on this group of disease agents, and hope to show that if something of practical value has already been achieved, the future promises that the laboratory may become of even greater assistance in this realm of disease. I propose, first of all, to discuss very briefly the probable nature of these so-called filterable viruses, and then to deal with the question of immunity in diseases of this class, for it is in connexion with this latter question that much of practical import is going on.

The Nature of Filterable Viruses.

Much of the work and speculation which this intriguing problem has incited has merely heightened that atmosphere of mystery with which the unknown is invariably surrounded. This, I think, goes a long way to explain the difficulty which the clinician has experienced in approaching the subject. Some have endeavoured to show that these viruses are unorganized enzyme-like agents, a *contagium vivum fluidum* as Beijerinck first suggested. Others, while admitting their particulate nature, consider that they represent a form of life differing from that of the cultivable bacteria. Some would even have us believe that they are the product of diseased cells, a product which when brought into contact with fresh susceptible cells gives rise to the same diseased state, and in so doing engenders more of itself, the virus thus becoming both the cause and the result of the disease. I do not deride speculation, for I recognize that it denotes a healthy and useful attitude of mind, but it is perhaps unfortunate that much of the speculation which this problem has called forth has served largely to cloud the issue. Surely it would have been better to start from the simpler and more obvious conception that these viruses are akin to bacteria than to evolve an ingenious hypothesis postulating a new form of life and endeavour to make observed facts support it. If one accepts a view of kinship as a working hypothesis the first question is: Are these viruses living? Now this is not such a simple matter to settle as one might imagine. The line of demarcation between the living and non-living is by no means clearly drawn; in fact, there is no single criterion of life. But there are certain characters (such as the power to multiply, to adapt to altered environment, and to assimilate from the surrounding medium without loss of individuality) which when present together are characteristic of living things; since filterable viruses possess all these, one is justified in assuming that they are alive.

Having admitted the living nature of these agents a second question demands solution; this concerns their relation to the bacteria with which we are familiar. One factor, more than any other, has tended to obscure this issue—namely, the limitations of the microscope. Using the visible portion of the spectrum, particles below a certain size cannot be seen with the microscope; although, of course, this is a purely artificial limit it has had a profound effect on the way in which the problem of the nature of filterable viruses has been envisaged. We have become so used to staining bacteria and examining them by means of the microscope that we question the bacterial nature of a virus which does not lend itself to demonstration by the usual methods. This has led to these viruses being termed ultra-microscopic; but though some of them probably do merit that designation, there are others which are almost certainly within the limits of visibility with the microscope. The bodies described by Paschen in vaccinia virus, which many now hold with Paschen to be the virus, can be stained and seen under the microscope, and the virus of psittacosis is definitely associated with most characteristic bodies which I believe to be the virus. Another example is the virus of fowl-pox, so that there seems good reason for stating that "ultra-microscopic" is not a character common to this group of viruses. Undoubtedly they are extremely small, as is evidenced by the fact that the majority can traverse filters which hold back the ordinary bacteria, but is this a sufficient reason for marking them off as something different? I do not think so. Some of the so-called filterable viruses filter with great difficulty—vaccinia for example—and on the other hand there are visible and cultivable bacteria, such as *Bacterium pneumosintes*, and a number of small saprophytes in the human nasopharynx, studied by Olitsky and Gates[1] and by Dochez and his colleagues,[2] which pass through the more porous bacterial filters. On the score of size, then, there seems no good reason for separating these viruses from the bacteria; the one group merges imperceptibly into the other.

The inability to cultivate the so-called filterable viruses in a lifeless medium is another reason advanced for assuming that they are not bacterial in nature. For a time our only method of cultivation was in the tissues of the living animals, but the work of Steinhard and Lambert,[3] Parker and Nye,[4] Carrel and Rivers,[5] and others, has shown that they could be made to multiply in the presence of living cells in tissue culture, and the Maitlands[6] have further simplified this method of cultivation. Even though we were still unable to grow these viruses apart from living cells, I should hesitate to advance this as a reason for their being unlike bacteria, for there are visible bacteria, such as the leprosy bacillus, the cultivation of which in artificial media, despite repeated attempts in the past, is only a recent achievement which awaits confirmation. Recent work by Muckenfuss and Rivers[7] with the virus of vaccinia would seem to suggest, however, that the virus does not multiply either inside or at the surface of the living cells. Using Maitland's medium, which consists of rabbit's serum diluted with Tyrode's solution added to fragments of fresh tissue, they have obtained survival and possible multiplication of vaccinia virus when the living tissue was separated from the virus by means of a collodion membrane. This would suggest that the function of the living cells is to supply some diffusible substance necessary to the growth of the virus; should this work be confirmed, it may ultimately lead us to a method of artificial cultivation which would remove this apparent difference between the filterable viruses and cultivable bacteria.

No doubt there are competent authorities who will disagree with me, but in my opinion the available evidence strongly supports the view that filterable viruses are bacterial in nature. With each step forward in our knowledge of these viruses, the line of demarcation between them and the bacteria becomes less and less obvious, and I look forward with some degree of confidence to the time when the filterable viruses and bacteria will be merged into one large group, inside which, of course, there will be slight differences—subgrouping—just as there is in the case of bacteria at the present time.

*Read in opening a discussion in the Section of Medicine at the Annual Meeting of the British Medical Association, Winnipeg, 1930.

Immunity in Virus Diseases.

It has become usual to speak of the immunity in virus diseases as being solid and long-standing, lifelong even, in contradistinction to the immunity resulting from bacterial disease, which is so often fugitive; but like most generalizations this is only partially true. Undoubtedly recovery from many filterable virus diseases is accompanied by the development of an immunity of high degree and long duration. One knows, for instance, how seldom an individual contracts diseases like measles, mumps, or yellow fever more than once. But there are diseases due to filterable viruses such as foot-and-mouth disease, herpes, and the common cold—the recent work of Dochez and his colleagues would seem to warrant the inclusion of the last disease in this category[8]—in which the immunity is fleeting and of low grade, just as there are bacterial diseases such as typhoid fever which confer a good immunity. Here again the division between the two groups is not absolute.

Immunity to a bacterium is associated with the development of antibodies, the presence of which in the blood can be demonstrated in a variety of ways. Although the importance of these antibodies in ensuring the immune state varies in the different bacterial diseases, there can be no doubt that either alone or in co-operation with the phagocytic cells of the body they play an important part in the defence mechanism of the organism. This is not their only importance, for, of course, they are of the greatest service to us in diagnosis. It has been recognized for some time that immunity to filterable virus diseases is associated with the development of specific antibodies which, from the method employed for their demonstration, have been spoken of as neutralizing antibodies. During the last few years there has been a tendency to minimize the importance of these antibodies in the vast majority of filterable virus diseases, and to speak of the immunity as being almost entirely cellular—a tissue immunity. Recent work, however, has gone a long way to controvert this view, and there seems little doubt that in filterable virus diseases, just as in those of bacterial origin, the two factors—cells and humours—work together in defending the tissues from invasion. An active immunity can be obtained against a filterable virus by methods similar to those employed in the case of a bacterium; a viricidal serum can be utilized to procure a passive protection, and with this serum the same immunity reactions that we are familiar with in bacterial diseases can be demonstrated. Let us consider these phenomena more closely.

Active Immunization.

There are two diseases due to filterable viruses against which prophylactic vaccination has been practised for a considerable time. I refer to small-pox and rabies. In the case of the former disease we make use of the fact that the virus of small-pox when adapted to the cow loses its invasive power for the human organism, so that when implanted in the skin it gives rise to a local lesion only, the evolution of which, however, confers immunity against the virus of small-pox. The principle involved—namely, the use of living virus which has been altered by passage through another animal species—is of limited application, for, apart from small-pox, fowl-pox is the only other example of a virus disease in which it is applicable.

Although this method of prophylactic immunization is good in that it produces a high degree of immunity, it is not without its dangers. Vaccination in Europe has been complicated of late years by an encephalomyelitis with a high mortality. It is true that the incidence of this complication is very low, about 1 in 40,000 vaccinated, or 1 in 4,000 of primary vaccinations at a susceptible age. But few though these cases are they cannot be ignored, and we must consider what steps are to be taken to avoid their occurrence.

The etiology of the condition is still under dispute, some holding that the disease of the central nervous system is the work of the virus of vaccinia, while others maintain that it is due to a dormant neurotropic virus which is stirred up by the vaccinia virus. Whichever view may be correct it would seem obvious that the occurrence of such a complication would be minimized or entirely avoided by reducing the amount of virus inserted locally in vaccinating, for the more virus implanted in the skin the greater the amount of virus which will invade the body generally. In England this view has led the Ministry of Health to issue an order that vaccination is to be made with one insertion only, with minimal trauma, and at the London Hospital we have employed dilution of the lymph. Gins also advocates dilution of the lymph, and it is possible that in Canada the immunity from these troubles has been due in part to the fact that vaccination is less drastic than in Great Britain. By still greater attention to the question of dosage the method might possibly be made quite safe, but, personally, I should like to see a method evolved in which inactive or dead virus was used. There are considerable difficulties to overcome, however, before such a method will be available.

Active immunization against rabies involves another principle—namely, the use of attenuated or inactive virus. The classical method makes use of drying to attenuate the virus, but carbolized virus is used with equally good results. For long this principle was not considered as applicable to other virus diseases, and the view that the production of lesions with living virus was an essential factor in the development of the immune state was almost universally accepted. The observation, made independently by Vallée and his colleagues[9] at Alfort, and by the British Foot-and-Mouth Committee,[10] that the virus of foot-and-mouth disease could be rendered inactive by low concentrations of formalin and yet retain its antigenic power has put another aspect on the matter. I am not claiming that the immunity produced by inactive virus is as solid as that called forth by living virus; I do not believe that it is. But the method has its uses, and it has since been shown that vaccines can be prepared by this method from other viruses, such as fowl plague, distemper, and yellow fever. The work of Laidlaw and Dunkin,[11] in the prophylaxis of distemper, has been particularly successful. They make use of two vaccines: the first an inactive formolized vaccine which produces a certain degree of immunity, which is then converted into a solid immunity by the second vaccine consisting of living virus. The method has already passed beyond the sphere of experiment, and has been applied in the field with manifest success.

In other diseases progress along these lines has not been so rapid. Although in France a formolized foot-and-mouth vaccine has been used in the field to a limited extent, in England it is still in the experimental stage. In the case of this disease, however, it must be remembered that the spontaneous disease gives only a fugitive immunity, and a further complication is the existence of three immunologically distinct types of virus. If an attack of a disease does not confer a durable immunity one cannot hope to achieve very much by the administration of vaccines as a prophylactic measure, and this fact must be borne in mind when considering such diseases as the common cold and influenza, where one attack appears to confer little or no resistance to subsequent ones. There is another observation made by Laidlaw and Dunkin in connexion with their work on distemper which puts a check on undue optimism. The supply of a filterable virus in any great quantity, at any rate at the present time, is obtained from the tissues of an infected animal. In the preparation of distemper vaccine, for instance, use is made of the tissues of an infected dog. Both the dog and the ferret are susceptible to this disease, but though a formolized ferret vaccine works admirably in the ferret it is a poor vaccine for the dog, and vice versa; the animal tissues present in the vaccine, when foreign to the vaccinated animal, interfere with the development of immunity to the virus. It is easy to see how this will mitigate against the successful application of the method in man, at any rate for the present. I make that qualification because much will depend on the progress which we can make in the cultivation of the filterable viruses. The work of Muckenfuss and Rivers, which I have already mentioned, gives some hope that this apparently insuperable difficulty will eventually be overcome. We had hoped at the London Hospital to evolve a method of vaccination against small-pox on lines similar to those employed in distemper. My colleague Dr. Bland has carried out a

number of experiments with this object in view, but his efforts so far have not met with success. Formolized vaccine virus, inactive to the extent that serial passage in animals will not reactivate it, has only produced a very low-grade immunity, insufficient to protect even against a comparatively small dose of active virus. This has been a disappointment, but it should stimulate us to renewed effort. Research has given us a method of prophylactic vaccination against the filterable viruses which has proved its value in veterinary medicine, and I am optimistic enough to hope that further work will overcome the difficulties in the way of its exploitation in protecting man against some of the filterable viruses to which he is susceptible.

Passive Immunity.

I mentioned previously that immunity to a filterable virus was associated with the presence of a specific antibody in the blood. The serum of a person, for instance, who has had yellow fever, when mixed with yellow fever virus in suitable relative proportions, will render that virus innocuous for a susceptible animal; it has neutralized it, hence the term neutralizing antibody. But the presence of the antibody can be demonstrated in another way, of which I propose to give you an experimental example.

The guinea-pig is susceptible to the virus of herpes. Implanted in the shaved hairy skin, this virus gives rise to the typical vesicular lesion which characterizes human herpes. If one infects a series of guinea-pigs and essays reinfection in them at daily intervals it will be found that seven days or so after infection they can no longer be reinfected; they are immune, and it can further be shown that the onset of this immunity coincides with the appearance of a specific herpetic antibody in the blood. Such an immune guinea-pig can be hyperimmunized by giving it a series of inoculations of living virus, and thereby the neutralizing power of its serum for herpes virus can be considerably increased. Inject 2 c.cm. of such a hyperimmune serum into a normal guinea-pig, and twenty-four hours later test its susceptibility to herpes virus. It will be found to react very slightly, if at all, to a dose of virus which produces an intense reaction in an untreated guinea-pig; the guinea-pig has been passively immunized to herpes virus.

This method has its application in human disease, but since one cannot subject individuals to a process of hyperimmunization as was done in the case of the guinea-pig, use has to be made of convalescent serums. In Canada there is full appreciation of the value of the use of convalescent serum in poliomyelitis, but less, perhaps, of the prophylactic use of measles convalescent serum. Serum collected early in convalescence has a considerable antibody content, so much so that when administered up to the fifth day after exposure to infection in doses varying from 1 to 10 c.cm. according to the age of the person, it will give complete protection; and the same dosage given later, from the fifth to eighth day after exposure, though no longer protecting against measles, modifies the attack. In children under 2 years old, in whom measles is a redoubtable disease, one aims at giving complete protection; but in older children, unless they are delicate, it is better to give partial protection, for the modified measles is a trivial affair and the patient gets the benefit of acquiring a solid immunity to this disease.

Although this method has its uses in private practice it has its chief applications in children's hospitals and in the children's wards of our large general hospitals. In the Hospital for Sick Children, Great Ormond Street, this method has been applied for some time now, and has proved of the greatest service It is also in use in the wards of the children's department at the London Hospital, and whereas prior to its introduction a case of measles appearing in the ward meant closing the ward to new cases and passing through a period of quarantine, now, the offending case having been dispatched to the fever hospital, the remaining children receive passive protection and the routine of the ward continues uninterrupted. The great drawback is, of course, the difficulty of procuring an adequate supply of convalescent serum. The recent success recorded by Fairbrother[12] in producing an effective anti-poliomyelitis serum in a horse makes one hope that it may not be impossible to produce viricidal serums of effective titre in animals such as the horse, and so become independent of the limited and precarious supply of antiserum which convalescents now provide. But here again, as in the case of active immunization with vaccines, much will depend on the progress made with the problem of cultivation.

Immunity Reactions.

A valuable aid to diagnosis is given by such methods as the Widal and the complement fixation tests, and since virus infections give rise to specific antibodies one might expect that these same reactions would be of service in this group of diseases also. Experience is showing that this is the case.

Gordon[13] has shown that with the viruses of vaccinia and small-pox both specific flocculation and complement fixation reactions can be demonstrated, and recent work by Burgess, Craigie, and Tulloch[14] has demonstrated the practical value of the flocculation test. Small-pox in England is almost entirely of the mild type, the so-called alastrim, and frequently these cases present difficulty in diagnosis. The flocculation test is performed with a specific serum prepared in the rabbit and a suspension of the crusts from the lesions of the suspected case. The use of this test by Burgess, Craigie, and Tulloch during an outbreak of mild small-pox in the South of England and North-East England, has shown how very helpful it may be. These investigators examined material from fifty-three cases of small-pox, fifty-two of which were of the mild variety, and in only three of these cases was there any difficulty in interpreting the result of the test. The findings with the flocculation test were checked by comparison with the clinical and epidemiological data, and by the result of vaccination during convalescence; complete agreement between the laboratory and field investigations was observed. Further, the crusts from twenty-seven cases of varicella, one case of septic rash, and one of impetigo were examined with entirely negative results.

When it is recalled also that in Great Britain the percentage of the population vaccinated against small-pox is steadily decreasing, it becomes evident that the control of this disease will depend to an increasing extent on the early recognition of cases, and the value of a diagnostic flocculation test as an aid to this cannot be over-estimated. The Bordet-Gengou reaction, or reaction of complement fixation, is also given by an antiviral serum in the presence of the specific virus. Mention has been made of the work of Gordon with vaccinia and small-pox viruses in this respect, and the researches of Netter and Urbain, Wollman, Marie, Ciuca, and others have shown that this reaction can be demonstrated in the case of other filterable viruses as well. At the London Hospital, Dr. Bland and I[15] have devoted a considerable time to the study of this question, and we have evolved a technique which has given very satisfactory results. The viruses worked with have been those of vaccinia, small-pox, herpes, and zoster; and although much of this work has been carried out with hyperimmune serums prepared in laboratory animals, we have been able to demonstrate the same phenomenon with serum from convalescents, though here the reaction is weaker, as one would expect. In the case of the work on zoster, convalescent serums have been used entirely because of the lack of a suitable experimental animal in which to prepare a serum. It is true that difficulties are encountered in performing this test with filterable viruses, and its application is limited in certain directions. For instance, a vaccinia antigen prepared from the brain of a rabbit inoculated intracerebrally with this virus will not, in our hands, give specific fixation of complement, although one can demonstrate that the antigen contains an abundance of active vaccinia virus. And yet this same brain antigen will produce a serum which will give good fixation with an antigen prepared from vaccinial lesions produced in the skin or testicle. The reason for this is obscure and is still being investigated, but despite these occasional anomalous findings, we consider that the reaction is virus-specific and capable of considerable service in practice. I will give some examples.

A case of encephalomyelitis was admitted to the London Hospital under the care of my colleague Dr. W. R. Brain. This patient had an extensive zoster of the head and neck, and symptoms indicative of involvement of the brain and cord which

had developed subsequently to the zoster eruption. The question naturally arose whether the encephalomyelitis was due to the zoster virus or not, but since both the vesicle fluid collected from the eruption and the cerebro-spinal fluid fixed complement in the presence of known zoster convalescent serums, there was little doubt that the case was in fact one of zoster encephalomyelitis. It is true that the reaction given by the cerebro-spinal fluid was not as strong as that obtained with the vesicle fluid, but it was nevertheless quite definite, and cerebro-spinal fluids from cases of encephalomyelitis complicating diphtheria and scarlet fever gave entirely negative results.

Recently I have had the opportunity of examining the serum of individuals who had recovered from psittacosis for the presence of specific complement-fixing antibodies, and here again I have obtained evidence of a specific reaction. Psittacosis may not be so rare a condition as is imagined, and apart from extensive outbreaks like the recent one, where the number and severity of the cases inevitably attracted attention, sporadic cases probably occur from time to time and pass unnoticed. The inoculation of animals is too slow a method to be of practical use as a diagnostic procedure, and a specific serum reaction would be a great help in clearing up the diagnosis.

It may be said that the examples given are both of rather rare conditions, but the principle is nevertheless of general application. In this brief and rather sketchy survey of the present position of research in the realm of filterable viruses an attempt has been made to show that something of practical import has been achieved. Undoubtedly an enormous amount remains to be done, but the number of workers in this field is steadily increasing, and on every hand a determined effort is being made to gain a clearer understanding of this group of viruses. Some of the problems seem almost insoluble, but it must not be forgotten that the commonplace in bacteriology to-day must have appeared equally obscure to those who preceded Pasteur.

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MIGRATION AND HEALTH.*

BY

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TO-DAY the distribution of the white population throughout the British Empire is so important that it warrants consideration not only from an economic and social point of view, but also from the point of view of health.

It is perhaps as necessary for Great Britain as for any country other than Japan to organize emigration on an extensive scale, on account of over-population. After or during every great war, there appears to have been a "stock-taking." Thus, after the South African war, the English Inter-Departmental Committee in 1904 showed that sections of the people, more especially in the more congested centres of population, were liable to suffer from the ill effects of overcrowding, or an artificial, unnatural environment. As a matter of fact, there was no evidence of actual physical deterioration, since no previous standard for comparison existed.

Actually the average span of life has advanced ten years during the present generation; and man to-day has excelled in feats of physical endurance and established records surpassing those of earlier periods. We do know, however, that a considerable proportion of people are below an optimum of health and efficiency, physical, mental, and moral. Conscription in Great Britain, the United States, and New Zealand, during the later stages of the war, brought to light some startling statistics. Although it is possible to prove anything by statistics—even the truth—yet it is certainly disquieting to learn that "in the average, out of every nine men of military age in Great Britain, only three were found fit; two were upon a definitely infirm plane of health; three were incapable of undergoing any extra exertion, being practically physical wrecks; and the remaining man was a hopelessly chronic invalid." In Great Britain alone, a million men examined at the recruiting depots were found to be not sufficiently fit to be worth training for war service owing to structural defects or organic disease.

In regard to conditions to-day, the following passage occurs in Mr. and Mrs. Sidney Webb's monumental work, *The History of the Poor Law*:

"Is there any condition more sordidly tragic than the lot of the youthful unemployed—to-day counted by the hundred thousand, under-nourished, physically undeveloped, empty-minded, lounging in disconsolate groups at street corners, or aimlessly tramping from one casual ward to another—a prey to all evil influences?"

In Australia and New Zealand, although the conditions under which the masses live are vastly better than in Great Britain, still it is comforting to read the statement of the late Professor Cunningham, the distinguished anthropologist:

"In spite of the marked variations which are seen in the physique of the different classes, anthropologists believe, with good reason, that there is a mean physical standard, which is the inheritance of the people as a whole, and that no matter how far certain sections of the people may deviate from this by deterioration, the tendency of the race as a whole will always be to maintain the inherited mean. In other words, those inferior bodily characteristics which are the result of poverty (and not vice, such as syphilis and alcoholism), and which are therefore acquired during the lifetime of the individual, are not transmissible from one generation to another. To restore, therefore, the classes in which this inferiority exists to the mean standard of national physique, all that is required is to improve the conditions of living, and in one or more generations all the ground that has been lost will be recovered."

The Anzacs.

Together with the sister overseas Dominions of Canada and South Africa, Australia and New Zealand offer a field for studying the effects of what is or ought to be generally a healthy and natural environment on a people, for the most part at least, only one or more generations removed from the parent stock of the British Isles, or, in the case of parts of Canada and South Africa, people from France and Holland. Sufficient data have already been collected with regard to school children to show that the improved environment has had a beneficial effect. Records collected by the late Mr. Symons and myself for the New Zealand Health Department in 1908 and 1909—quite as extensive as to numbers examined as the data available to witnesses at the time of the Inter-Departmental Committee—were especially interesting in showing that, while the average stature at the ages of 11 to 12 of boys in the public schools in England in 1883 was 54.98 inches, that of the cadets of the Auckland Grammar School and King's College was 56 inches at the same age. Contrasting the heights of boys at Marlborough College, England, with those of King's College, Auckland, and Wanganui College, we found that between the ages of 14 and 15 the figures were 61.96 for the famous English public school and 63 for the New Zealand schools. Even more interesting was the fact that a comparison between the boys of the Chapel Street School, Auckland (probably the children of the poorest parents of the largest New Zealand city), with the boys of Remuera (the wealthiest suburb), showed less disparity than the measurements and weights of children in the poorer districts of English cities as compared with the children of the more prosperous parents residing in the suburban centres and the boys of the English public schools. Such a result was only to be expected in a country where there is not the severe handicap of poverty—such a dead weight in some of the congested centres of Great Britain. Moreover, the prowess of the young Australian and New

* A paper contributed to the Section of Medical Sociology and History of Medicine at the Annual Meeting of the British Medical Association, Winnipeg, 1930.

Zealander in the field of war or of sport need not make him ashamed to meet the stranger either within or without his gates.

Dr. Harvey Sutton, Director of the School of Hygiene and Tropical Medicine, Sydney, late Principal Medical Officer to the Education Department, New South Wales, has shown by statistical tables and graphs that the individual Australian boy or girl is physically superior to the Australian born with one British parent, and the latter to the child with both parents born overseas, judging by height and weight. Whether the comparison is made in the metropolis, town, or country, the more Australian the child, the better the physique. The rural child of whatever "Australianship" has been shown to outstrip the child of the large country town and of the metropolis; between these the difference is much slighter. Although the Australian figures for recruiting examinations have not been properly analysed, where three out of nine were classified A1 in England, about four in every nine were up to the standard in Australia. The C3 class was certainly smaller. The predictions of school hygienists in regard to the findings of from 50 per cent. to 60 per cent. of defectives in schools were thus verified. Dr. Sutton points out that the defects in the years of school life prove to be the basis of the later physical deterioration.

Thus all is not well, even in Australia. Lieut.-General the Honourable Sir Neville Howse, V.C., K.C.B., the distinguished Director-General of Medical Supplies of the Australian Imperial Force, later Australian Minister of Defence and Minister of Health, expressed grave doubts in 1921 whether 50 per cent. of Australia's young men were fit for active service. In a note on the health of the young male Australian, written in reply to a request by myself, as to the percentage of those volunteering for service who were fit, he stated:

"The necessary information is not available to make an authentic statement, but a certain amount of reliable evidence does exist which lends support to my belief:

(*a*) Out of 21,000 senior cadets, born in 1905, who were examined, 13.6 per cent. were found unfit for transfer to the Citizen Forces, notwithstanding that many medical officers passed a number whom they recognized would never be fit for service, but who would, in their opinion, be benefited by a few years of physical training;

(*b*) Dental examination of Citizen Forces at camps of training shows that a large proportion suffer from dental defects unfitting them for active service."

These facts, together with the appalling number of men who during the war were found, on examination, unfit not only for active service but for strenuous civil employment, are a travesty on public health. Speaking generally and comparatively, however, the good physique of the Australian Imperial Force was conspicuous—as might be expected in a voluntary army from a country blessed with a good climate, good stock, and with a people given to outdoor life and sport—even in our cities which possess a healthful open-air environment, where slum conditions are few, and overcrowding has not existed long enough to cause any deterioration of type.

The analysis of the present population of Australia shows that 97 per cent. are of British origin, and actually 99 per cent. are British subjects. Although Australia and New Zealand have the greatest natural increase of population in the world except Quebec, at the present rate of natural increase—the difference between births and deaths being only 2 per cent. per annum—we would have 12 million people in thirty years, even if we did not get a single immigrant, and at least 50 million in a century, through natural growth, actually as many people as there were in the United States of America at the end of its first century.

Ellsworth Huntington, in *Civilization and Climate*, makes out a convincing claim that climate is the chief factor in the development of a nation. A mean temperature of 64° F., a mean humidity of 80 per cent., and frequent changes of temperature, are the best conditions for physical work. He shows that people who, like the Scotch, live under conditions of relative storminess, become industrious, capable, and successful.

McCollum, on the other hand, in *The Newer Knowledge of Nutrition*, emphasizes diet as the prime factor in the development of a people. He ascribes, for instance, the virility and progress of the Canadians in contrast with the sloth, improvidence, and retrogression of the people of the Bahamas—both descended from a common loyalist stock who emigrated from the Northern and Southern States, rather than live under the Stars and Stripes—not so much to the highly stimulating climate of Lower Canada in contrast to the mild and uniform climate of the Bahamas, as to the difference in diet. The Bahamas produce tamarinds, olives, lemons, oranges, limes, citrons, pineapples, pomegranates, figs, bananas, melons, yams, potatoes, cucumbers, sugar, maize, and peas, or fruits and vegetables not unlike those of Queensland and the Northern Rivers district of New South Wales, but their bread and meat are imported. The people of Lower Canada subsist mainly on cereals, peas, beans, potatoes, meat, milk, cream, butter and cheese—a diet similar to that of the people of Australia.

With regard to the Australian national diet, D. T. Sawkins, in a memorandum to the New South Wales Board of Trade, states:

"The average food supplies per head of population remain the most important factor in determining national physique. It is hard to avoid the conclusion that the comparatively superior physique of the Australian soldiers was built up on the liberal average diet of the decades before the war. Then, the average gross supply of meat in New South Wales was 240 lb. to 290 lb., in contrast to the present [1922] consumption of 170 lb. to 200 lb. per man per annum. If this great change in the national diet is to stand for any considerable period, then a great change may be expected in the national physique."

Equally true with the dictum that an army fights on its stomach is it that "the fate of nations depends upon how they are fed," and, as my old teacher, Professor E. J. Hamilton, used to say: "It is better for a man to have a good stomach than a good head."

As far as the health and longevity of the individual is concerned, however, second only in importance to being begotten of a healthy long-lived stock or parentage, is the food of the mother during his pre-natal life, and his diet in infancy. The first fundamental requisite to rear a healthy race is of course that children should be fed, as Nature intended them to be, at the breast of mothers who have themselves been well nourished by a well-balanced vitamin and mineral-containing diet of which fresh milk, salads, and fruit should be the chief constituents.

The superior physique of the pastoral peoples of the past, as of the present, is chiefly the result of a generous milk ration. One cannot visit the Hawkesbury District of New South Wales without commenting on the fine physique of the people, undoubtedly due, as far as the earlier generation is concerned, to a diet of milk, maize, meat, fruit, and other fresh foods, rich in vitamins and mineral constituents, combined with a life in the glorious sunshine and fresh air. It is regrettable that resort to the grocery store rather than to local farm produce, and the feeding of whole maize to the fowls rather than to the children, is not maintaining the fine physique of the Hawkesbury native. The "cornstalk," a New South Wales type with a reputation for lankiness and wiriness, is the immediate successor of the Hawkesbury native. A visit to a Hawkesbury race meeting shows that the older generation consists of tall, brawny, well-made, big men. Mr. J. H. M. Abbott, hailing from the Hawkesbury River Flats, writes:

"The first of the free settlers who commenced the march westwards 'squatted' there, and owned the land by right of occupation. If they could obtain them, they took wives unto themselves, and reared up families. And the families subsisted principally on pumpkin and ground maize, and wore no boots in their childhood, and led a free, wild, untrammelled sort of life. So they grew into tall, clean-limbed, deep-chested men, and sturdy, comely women, and spread north and west and south over the land—and their offspring were the fathers and mothers of the Cornstalks of to-day."

The Analogy of the Merino.

The people of Australia to-day owe a great debt to Captain John MacArthur of Camden Park, who imported the first merino sheep in 1796. The pioneers were told that the climate was unsuitable and that the merino wool would deteriorate as the sheep were taken nearer the Equator. At the beginning of last century the heaviest fleece grown weighed 3½ lb., whereas actually a fleece of 35 lb. was recently

cut from a stud sheep. The merino sheep to-day, however, is very different from the original stock. Some of the direct descendants are still to be seen at Camden Park. Various strains have been crossed with the original blood—Saxon, Negretti Infantado, and, above all, the French Rambouillet. Thousands of the last strain were brought to Australia in the first half of last century. So readily did they adapt themselves to their new environment that it was speedily recognized that this type was ideal for producing fine wool under our special conditions of sunshine, climate, and green pasturage. Since then the great sheep breeders have evolved a truly national Australian merino, quite distinct from all the older strains of Europe—greater in every respect, greater, indeed, than any other variety of the breed in any other country in the world.

Two young Englishmen of French extraction—the Pepins—must be credited with the actual development of the merino as it is known to-day. In 1864 they began to build up a stud flock at Wanganella, by purchasing a ram, now famous under the name of "Emperor," a big well-proportioned, plain-bodied, outstanding animal with strong head and horns. So well did he nick with the Wanganella ewes that he became leader of the stud. The progeny of the other imported animals was gradually eliminated, until the whole flock became inbred to him.

Various sheep breeders since the day of the Pepins, like the Falkiners, the Austins, the Mills, the Millears, the McKaugheys, and others, by careful selection, judicious mating, and heavy culling, have improved each generation until now our large flocks are bred to type with variations according to climate and soil. Stamina above everything else is the quality demanded. Pampering is anathema to the big breeders. Science has come to the assistance of the stud masters. For instance, Professor Brailsford Robertson says that "if any one of the amino-acids that build the tissues of the sheep is lacking in the food supply of the animal, the whole of the rest of the food becomes valueless as far as building up the tissue is concerned."

The industry of sheep breeding is now being conducted on a more scientific basis. Who can say whether sheep at the end of the present century will not be carrying twice the fleece they carry to-day, when they average 8 lb. per sheep, instead of the average of 3 lb. half a century ago? If we could apply the same system to the human element in Australia—that is to say, cull by the elimination of the unfit, especially the mentally unfit, and select the best type of immigrant, physically, mentally, and morally—we would still further improve the present breed. Certainly the fine agricultural country type of Englishman, Irishman, and Scotsman, predominating before 1820, which may have deteriorated to a certain extent by the industrialism of the later years of last century, is being reproduced in Australia, South Africa, Canada, and New Zealand by a type which bids fair to be even better in physique.

The Growth of Population in Australia and Canada.

The causes of emigration are stated to be adversity, economic distress, and the attraction of the prospect of wealth and improved conditions, apart from the earlier causes, such as political or religious oppression. The great migration between 1841 and 1847 when 2½ million people left Ireland, mainly for the United States, was caused by the years of potato famine. As far as Australia, including Tasmania, is concerned, although in the early days a certain number of people are said to have left their country for their country's good, undoubtedly many of them made good in the new country, as was the case also with Virginia and Maryland in America, where those transported became in many cases industrious and exemplary citizens.

Australia to-day is peopled by immigrants or the descendants of immigrants. There is no one living in Australia (other than the aborigines) who is a descendant of the fourth generation of Australians. We have actually an area of 3,000,000 square miles, nearly equal to that of the United States of America, four-fifths of that of Canada, over one-fifth of the area of the whole of the British Empire—that is, more than three-quarters of the whole area of Europe, and actually twenty-five times as large as Great Britain and Ireland. We have a population of only 6½ million, while Great Britain and Ireland have a population of roughly 50 million. As a matter of fact, the Dominions overseas, embracing Canada, Australia, New Zealand, and South Africa, have only about 18 million whites. It is to be remembered, however, that five-thirteenths of Australia is within the Tropics.

In spite of the distance from the Motherland, the population of Australia since Governor Phillip landed 141 years ago has shown phenomenal growth, especially in the last hundred years. During this period it has grown to the same size as that reached in Canada in three centuries. The most conservative estimate of the population that Australia could accommodate has been stated to be 40 million. The Right Honourable William Morris Hughes estimated that Australia could maintain a population of 100 million, while some have put the figure as high as 200 million.

While Canada occupies one-sixteenth of the world's area, it has only one two-hundredth of its population. The first settlement in Canada was at Port Royal or Annapolis, Nova Scotia, in 1605. By 1763 there were 90,000 people, in 1800 a quarter of a million, whereas now there are 10 million. In Canada to-day 78 per cent. of the people are native born, while only 14 per cent. are British born.

As showing how history repeats itself, the Napoleonic wars, just like the last war, created tastes, habits, and conditions incompatible with the peaceful activities of the new era that followed. The total population of the world in 1800 was 700 million, whereas it is 1,900 million to-day. During that time the population of England and Wales increased from 12 million to 38 million.

Immigration Problems.

The problem of the distribution of population throughout the British Empire is not so simple as it might appear. The mere transfer of the surplus population from one part to another which is sparsely populated, so far from solving the problem of unemployment, may tend to aggravate it. In Australia it is extremely difficult to absorb some immigrants, especially those whose ways and ideas have been set before they arrive; youths under 20 years, provided they are of reasonably good stock, can be made into good Australians. Older people find the conditions so different from their previous environment that they have difficulty in accommodating themselves.

One method of settling immigrants has been that of the group settlements in the south-west of Western Australia, where immigrants receive 160 acres of land and 10s. a day for two and a half years. These settlements are well described in *Amateur Settlers* by Lord Apsley, who found that one-third of the settlers within an area abandon their holdings. He ascribed seven failures out of ten to ill health. Mr. W. Banks Amery, British Dominions Office Representative in Australia, found that 32.5 per cent. of British settlers either abandoned their holdings or were dismissed. Of 1,105 Australian settlers, 45 per cent. left their holdings or were dismissed. Thus actually among "stickers" 68 per cent. were recent British arrivals and 59 per cent. native-born Australians. A Royal Commission found that one of the difficulties was the dislike of the women for dairying, and the preference of numbers of men to work for wages rather than accept the responsibility of fending for themselves. It was also found—as in the case of the returned soldiers from the war for whom many millions were spent in settlement on the land in Australia—that poor and unsuitable land had sometimes been selected. The opinion now prevailing is that these settlers should be placed only on first-class land, that payment should be by piece-work, and that they should be drafted into preliminary training camps. Altogether there have been 135 groups of settlers, which have provided a population of 9,580 at an expenditure of 3½ million pounds.

The Big Brother Movement, by which boys are brought out to Australia and placed under the protection of citizens, as the boys brought out under the Dreadnought Fund, has been satisfactory.

The general impression of the people with regard to the immigrants that arrive is that they are less than "fair average quality." Most of the States welcome land workers and

domestics, but do not encourage other immigrants except nominees—that is, those who have friends already in the country prepared to assist them.

Where the medical profession might do great work for the Empire is by encouraging a suitable type of youth to emigrate, one with a good family history, of good physique, ambitious, and above all, with a will to work. Dr. Stewart Mackintosh's observations[1] suggest that readiness of adaptation to change argues an ancestry derived from many and varied stocks, such as are usually bred together by urban influences. One result of the rapid transition from an agricultural to an industrial nation has been the disintegration of rural communities, their aggregation in new centres, and the extraction by a severe process of natural selection of types that could adapt themselves to industrial exigencies, and climatic and other conditions. The New World has drawn some of its most hard-working labourers from limbos of despair, men who develop a surprising physique and energy as soon as they can enter environmental conditions at all conformable to their physical needs. Professor Karl Pearson emphasizes "that it is essentially the man who makes his environment, and not the environment which makes the man." We have chosen to make ourselves an industrial nation and allow our agriculture to decay; we have offered industrial work to those who made their living on the soil, luring them into the cities and into environments differing in many respects from those in which they were brought up.

A few sons of medical men have come out to Australia since the war, received some training at the Hawkesbury Agricultural College, and, in some cases, are doing well on the land to-day. If anyone cared to organize a batch of sons of medical men, it would not be difficult to arrange for them to be met on arrival and have them distributed to sheep and cattle station owners or farmers in Australia and New Zealand on similar lines to the Big Brotherhood Movement. Certainly if they came out with the intention of settling and marrying, the Australian girls, who are even a finer type than the men, would give them a hearty welcome.

REFERENCE.
[1] Mackintosh, J. S.: The Effects of Intra-Migration on National Health, *British Medical Journal*, 1912, ii, p. 367.

RADIUM TREATMENT OF EPITHELIOMATA OF THE SKIN.*

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IN this opening paper I propose to deal mainly with the subject of basal-celled epithelioma or rodent ulcer, and to touch briefly on the question of squamous epithelioma, believing, as I do, that this disease has a surgical rather than a radiological aspect.

RODENT ULCER.

Radium is undoubtedly the best treatment in most cases of rodent ulcer; it is in this condition that the most striking and permanent results of radium therapy are obtained. Excision is equally effective in some cases, but, owing to the difficulty in excising completely even a small growth from the situations most commonly affected, radium is to be preferred. Cosmetically it gives results which cannot be obtained by any other method, the resulting scar being supple and the skin almost normal in appearance. *X* rays will cure a number of these lesions, but the treatment is tedious, and the action of the rays cannot be limited with such great accuracy. Recurrences are more frequent, and permanent healing is not so certain.

Clinical Varieties.—A rodent ulcer usually begins as a smooth, waxy, semitranslucent pearly nodule, which grows very slowly, often assuming the form of a rosette of nodules with a raised margin and depressed centre. A growth such as this belongs to the early hypertrophic variety, and frequently shows cystic degeneration. More nodules may appear and coalesce, thus forming a larger hypertrophic growth, or, owing to some slight trauma, the growth may break down, with the formation of a brownish scab. Gradually there develops a superficial ulcer with a gelatinous base, and the raised pearly margin which is so characteristic of the disease. The ulcerated area may heal over in one part, leaving a smooth atrophic scarred area, while in another part the disease continues to advance. This is known as the superficial flattened cicatrizing type, which has a characteristic braided margin. Both the hypertrophic and superficial ulcerative types may reach a considerable size, but generally remain limited to the surface. The disease may, however, extend deeply to reach the underlying tissues, penetrating muscle and bone, thus giving rise to deep irregular cavities. Such lesions of the deeply ulcerative variety seldom have the typical rolled edge; the margins are usually indurated and sharply cut, with a well-marked inflammatory zone surrounding the ulcer. Although there may be extensive local destruction of tissue, these growths never give rise to metastases unless they assume the clinical and histological appearances of a squamous-celled epithelioma. It is very important to recognize this transitional type. The relative frequency of the various types can be shown from an analysis of 1,773 consecutive cases treated at the Radium Institute, London:

Type of lesion.	Relative frequency.
Hypertrophic (small and large)	51 per cent.
Superficial:	
Ulcerative	30 ,,
Cicatrizing	3 ,,
Deeply ulcerated	16 ,,

The following shows the results for each group:

Type.	Apparently cured.
Hypertrophic	91 per cent.
Flat	77 ,,
Deeply ulcerated	38 ,,
All cases	77 ,,

Many of the last group were such that healing was out of the question, owing to extensive involvement of bone and cartilage.

Sites.—Rodent ulcers are most common on the face. The most frequent situations are the nose and cheek, as shown in the following table:

Nose	468	Chin	36
Cheek	377	Mastoid	22
Inner canthus	193	Trunk	21
Lower eyelid	151	Neck	20
Temple	141	Upper eyelid	19
Forehead	98	Lower lip	17
Ear	84	Eyebrow	12
Outer canthus ...	56	Scalp	10
Upper lip	47	Hand	4
Preauricular	37		

Etiology.

The disease is more common in men than in women—953 patients were males and 820 females. The youngest patient in the series was a girl who was first seen at the Radium Institute at the age of 19. She was sent on account of a deeply ulcerative lesion which affected the inner canthus, and had started as a nodule at the age of 12. It will be seen that the disease is most common between the ages of 60 and 70.

Age.	Frequency.
10–20	1
20–30	11
30–40	63
40–50	218
50–60	394
60–70	484
70–80	334
80–90	82
90–100	2

Multiple lesions are more common than is usually supposed. There were 94 cases in this series; 55 were in men and 39 in women. In one case a woman, aged 28, had as many as nineteen different lesions treated with radium.

Previous Treatment.—A number of patients had been operated on once or several times, and many had received treatment by *x* rays or radium at other hospitals. The disease had either recurred or had become resistant to

* A paper read in opening a discussion in the Section of Radiology at the Annual Meeting of the British Medical Association, Winnipeg, 1930.

repeated *x*-ray treatments. It is interesting to note that of the 240 patients whose lesions had previously become refractory to these rays, 102 were healed as the result of radium treatment, 32 were improved, while the remainder did not show any improvement or the results were not recorded.

Transitional Type.—Occasionally, as already pointed out, an undoubted basal-celled growth takes on the characteristics of a squamous-celled epithelioma. When this occurs the disease progresses extremely rapidly. There is early involvement of the lymphatic glands, and death occurs from cachexia and septic absorption. There were 40 such cases in this series; in 25 the lesions were situated in the neighbourhood of the ear, and in 11 of these they actually started in the pinna. It is interesting to note that all these patients had received repeated exposures of radium, and 11 had had previous *x*-ray treatment. In all there was marked secondary infection, no doubt an indication of lowered resistance.

Diagnosis.—The clinical diagnosis of a rodent ulcer is comparatively easy. Since there is a possibility that biopsy tends to activate a growth, it is our custom to confirm the diagnosis microscopically only in doubtful cases.

Treatment.—The fundamental principle, in this as in other conditions, is to estimate the dose sufficient to bring about the death of all the malignant cells without impairing the vitality of the surrounding normal tissue, so that healing will take place satisfactorily. The more radiosensitive types may be treated successfully by various techniques, and this probably accounts for the similarity in the results obtained at various radium centres, although the methods adopted are in many cases quite different. In discussing treatment it is advisable to consider each variety separately; the technique employed is determined by the type of lesion and the structures affected.

Small Hypertrophic Growths.

Growths extending only a little beyond the surface and mobile on the underlying structures should be treated by surface radiation. Exposure to the unscreened full strength applicator is the method of choice. This apparatus is a solid plaque containing 5 mg. of radium element per square centimetre; the whole of it is covered with thin rubber tissue to prevent contamination by discharges. All crusts must first be removed, and it is wise to protect the surrounding skin by rubber-covered lead sheeting in which a hole has been cut a little larger than the lesion, so that any outlying groups of cells may be treated. The apparatus should be applied for one to two hours, according to the thickness of the lesion.

The applicator emits a strong intensity of beta rays, which are sufficiently penetrating to reach all parts of the tumour. As a result of the beta radiation an erythema is noticed in about ten days, reaching its height in about three weeks. Over this inflamed area a crust forms, which dries and falls off towards the sixth week, leaving a soft and supple scar. When it is necessary to limit the irradiated area on account of the proximity of especially sensitive organs, it is advisable to use buried radium in the form of screened seeds.

Large Hypertrophic Growths.

It is particularly important in these cases to adopt a technique which will result in a homogeneous distribution of the rays to all parts of the tumour under consideration, so as to avoid any stimulating action which may be produced at the limit of the zone of action. It is therefore necessary to use screened apparatus. Probably the most useful procedure is to employ needles buried in and around the growth. The needles most commonly employed have walls of 0.3 mm. of platinum, and contain 2 mg. of radium per centimetre of active length. As a rough guide to the technique it may be stated that no part of the growth should be further than one centimetre from a source of irradiation, and it should be remembered that more massive doses should be placed at the periphery in order to obtain a homogeneous distribution. If needles were placed at the same distance throughout the growth, the centre, being irradiated by its own foci as well as those adjacent, would be exposed to a greater dose than the periphery.

Various modifications of this technique are employed with equally good results. Some authorities prefer a comparatively large dose for a short time, while others advocate exposures for ten days, and sometimes even as long as thirty days. It has been the practice at the Radium Institute never to increase the time factor beyond seventy-two hours' continuous treatment. So radio-sensitive are these tumours that equally satisfactory results are obtained by either method. It is the rule for complete cure to ensue even in advanced cases, providing they are of the purely hypertrophic type.

The Superficial Ulcerative Variety.—These are at first small hypertrophic growths which have ulcerated superficially at the centre, leaving the remainder of the growth as a rolled edge. Their treatment is similar to that of the hypertrophic growths from which they originate. In the case of small ulcers, which are mobile on the deeper structures, an unscreened applicator should be used for one and a half to two hours. A cure is almost invariably obtained. Larger ulcers in which there is much subjacent infiltration must be treated by other methods. By using a light screen, such as 0.1 mm. of lead, the less penetrating rays, which only act near the surface, are absorbed, leaving a more penetrating but weaker radiation, which must be employed for a correspondingly longer time. The full strength applicator, thus filtered, should be applied for two to four hours, according to the amount of infiltration present.

The Superficial Cicatrizing Variety.—This type should be treated in the same way by unscreened radium plaques. It is necessary to irradiate a considerable distance beyond the visible margin of the growth as outlying columns of cells are undoubtedly present in these situations.

The Deeply Ulcerative Variety.—This is the most severe form of basal-celled epithelioma and the most difficult to treat. Gamma radiation must be used; beta radiation with unscreened or lightly screened radium is not suitable. The method of employing Columbia paste plaques for prolonged periods of two to three weeks has been advocated for this form of rodent ulcer. The results are usually unsatisfactory and frequently disastrous, for, although in the course of these long applications the rays have more chance of finding the neoplastic cells at the moment of their greatest fragility, it is no less certain that the normal cells of the surrounding tissues are also affected adversely. The prolonged irradiation of the normal cells, and those already debilitated by the spread of the disease or by secondary infection, may result, not only in a radium necrosis, but in increased activity of the neoplasm. It is therefore advisable, in order to avoid the disadvantages of prolonged exposures on the one hand, or insufficient screenage on the other, to employ much larger amounts of radium screened through a minimum of 2 mm. of lead or its equivalent for a comparatively short period. In addition, means must be found to absorb the secondary radiations, and sometimes this is done by the interposition of Columbia wax or sorbo rubber, a measure which also provides a more homogeneous dose, by the distance which is created between the radium and the lesion. With this technique the duration of treatment varies between forty-eight and seventy-two hours. If the time is increased beyond a total of seventy-two hours, damaging effect may be produced, especially in old people. Although, of course, it is desirable to destroy all the neoplastic cells to avoid recurrence, this should never be done at the expense of destroying the adjacent tissues, the integrity of which is so necessary for satisfactory repair. Recently the use of needles or screened seeds has in some cases replaced or supplemented surface treatment. Needles are either inserted into or laid along the growing edge. In many of the more extensive lesions better results have been obtained by using this form of treatment than with a plaque of uniform intensity. Such are the lines along which the deeply ulcerative type should be treated when limited to the soft tissues. If, however, bone or cartilage has been invaded, an even shorter exposure will be advisable, since these structures, especially when devitalized by the invasion of the neoplasm, have a great tendency to radium necrosis. The results in this class of ulcer are not so good as in the former types. About one-third of the cases treated become healed, but many cases show

little or no improvement. Should no improvement be noted within two months, surgical treatment, such as excision with the diathermy knife and subsequent skin grafting, should be considered. In the more advanced cases it is exceptional to obtain a cure, but a large proportion show improvement with temporary arrest of the disease.

Repetition of Irradiation Treatment.

There is no doubt it is best to give a maximum dose at the first treatment, for after each successive dose a rodent ulcer becomes more refractory to treatment. It is supposed that repeated treatments cause some degree of radio-vaccination. On the other hand, a growth which has proved refractory to beta radiation will often respond to gamma radiation. A second exposure in those cases in which no healing has been obtained is usually of no use, and may only aggravate the condition. If, however, complete healing has not occurred, but a definite improvement is noted and there is still some induration left, a second treatment with a thicker screen may be required to affect the deeper limits of the lesion. Previous treatments produce an avascularity of the tissues, rendering them more susceptible to radium necrosis.

Radium should never be employed within six weeks of any previous treatment. When it is decided to give a renewed treatment, it is important to know whether a patient has had previous *x*-ray treatment. The age of the patient, the details of the previous dose, and its subsequent reaction, must all be taken into consideration. It is important to estimate the dose so as to avoid a "radium burn." Infection readily takes place, and an intractable ulcer forms which may take months or even years to heal. The term "radium burn" is often used incorrectly, being applied to the simple vesication and ulceration which follow upon an unscreened radium exposure, and which are an essential part of the reaction. In these cases a destructive reaction has been deliberately produced for a definite purpose, and satisfactory repair can be anticipated. The term "radium burn" should be reserved for the few instances in which the dosage has been excessive. The resultant ulceration may be extreme in degree; pain is severe and persistent, and repair is always slow.

Prognosis.

This depends on the age of the patient, the type of growth, its position, and the extent of the disease when treatment is commenced. In old people there is less resistance offered by the surrounding tissues to the advance of the disease. Ulcers of the hypertrophic group usually respond exceedingly well to irradiation. The flattened cicatrizing type shows a tendency to recurrence, and ulcers of the deeply ulcerative group are not so suitable for treatment; in fact, the value of radium in very advanced cases is doubtful, the patient's resistance to the disease is poor, and the power of repair is deficient. When the lesion is small radium treatment is usually successful. It is only when the disease extends to the deeper tissues, and infiltrates underlying bone or cartilage, that the prognosis becomes grave.

Ulcers in certain situations, such as the forehead, ear, and inner canthus, have a serious prognosis. When a mucous membrane is implicated, the condition also proves more resistant, and is often only eradicated by free excision. When an ulcer becomes secondarily infected it often responds poorly to radium. In some cases the sepsis appears to be aggravated by treatment, thereby only adding to the patient's discomfort.

Squamous Epitheliomata.

Squamous epitheliomata of the skin differ from rodent ulcers in their more rapid growth, and in their formation of metastatic deposits in the neighbouring lymphatic glands. These lesions are susceptible to the rays of radium, although not to the same degree as the basal-celled growths. The warty type in particular may be readily destroyed by irradiation, whereas ulcerative lesions prove more resistant. In the early stages of the disease, the results of excision are so good that radium should be reserved for the more extensive cases. In patients treated with radium a high percentage of cures has resulted; nevertheless the growth should be excised in operable cases, and this should be done with the diathermy knife.

When radium treatment is considered advisable gamma radiation must be used, interstitial radiation being the method of choice. Needles of low content should be employed with walls of 0.6 mm. of platinum, and containing 0.5 mg. of radium element for each centimetre of active length. They should be introduced into the healthy tissue in the immediate vicinity of the growth, and allowed to remain in position for a week. By the end of six to eight weeks the resultant reaction subsides, and the growth gradually disappears, leaving a smooth scar. The primary growth should not be regarded as apparently cured unless the treated area is perfectly soft. Any residual induration should be excised, as this may be the nucleus of a rapidly growing recurrence. Prophylactic doses of radium to the neighbouring lymphatic areas are of doubtful value.

When the glands are definitely invaded, the prognosis is very grave. In these cases needles or Columbia wax plaques may be employed. The immediate result is often encouraging, but the permanent disappearance of infected glands is exceptional. Much can be done to relieve symptoms and prolong life, but in its later stages the disease proves resistant to all forms of treatment.

THE TREATMENT OF LATE SYPHILIS.

BY

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During the past six years I have made increasing use of bismuth preparations in the treatment of late cases of syphilis. It had been my usual practice to treat such cases with bismuth intramuscularly, and with mercury and iodide orally, during the first three months, continuing thereafter with combined bismuth and arsenical therapy. Finding that in a considerable number of cases the Wassermann reaction became negative after the first three months' course, I decided to try the effect of more prolonged bismuth treatment instead of exhibiting the arsenicals.

The bismuth preparation used in this series of cases was neotrepol, of which 1 c.cm. is equal to 0.08 gram bismuth; 2 c.cm. of it were given weekly, so that in the normal three months' course each patient received 2.08 grams bismuth, together with 1,260 grains potassium iodide and 210 grains hydrarg. cum cret. One month's rest was given between each course, and the number of courses given ranged from two to six.

Records are available of 46 consecutive cases treated on this plan. The Wassermann reaction of 24 of these had proved resistant to previous arsenical treatment, while 22 had had no previous treatment whatever.

Clinically, the results were striking. Only two cases—one of central nervous system syphilis, and the other an advanced heart lesion—failed to respond, and the amelioration of symptoms was so marked that it was difficult to persuade many of the patients of the need for further treatment.

The influence of treatment on the blood Wassermann reaction, if less dramatic, was notable. In 30 cases (65.2 per cent.) the Wassermann reaction was rendered negative; in 13 cases (26.1 per cent.) the strength of the positive reaction was reduced, and in only 4 cases (8.7 per cent.) did it remain unaltered. Of the 30 cases in which the Wassermann reaction became negative, 9 did so after the first course, 7 after the second, 4 after the third, and 4 after the fourth. Of the 13 cases in which the strength of a positive Wassermann reaction was reduced, 5 received only two courses of treatment and 5 had three, while of the 4 cases in which the Wassermann reaction was uninfluenced, 2 had two courses and 2 had three.

The results in the cases which had resisted arsenical treatment differed little from those obtained where no

treatment had previously been employed—62 per cent. of the former became negative and 68 per cent. of the latter.

Of the 46 patients dealt with, 12 presented no symptoms when referred for treatment, although several of them were mothers of children showing clinical evidence of congenital syphilis. The Wassermann reaction in 11 of these cases was made negative; in the other it remained unaltered. Sixteen showed tertiary syphilitic lesions which had been present for over a year; the Wassermann reaction was made negative in 7 of these and remained unaltered in 2. In the remaining 18 cases the lesions, though tertiary, were of more recent appearance; in 12 of these the Wassermann reaction was made negative, while in 1 it remained unchanged.

In only 22 of the cases was the approximate date of infection known. In 12 the disease was of less than ten years' standing, and of these the Wassermann reaction was made negative in 7; the other 10 were of longer duration, and 4 of them became sero-negative. It was noted that the clinical and serological results in cases of late skin lesions were particularly good. Three of the cases in which serological improvement occurred were at one stage of their treatment sero-negative, but subsequently relapsed. One of these patients attended for treatment very irregularly, and only received three courses in two and a half years.

The patients tolerated the treatment well, though in three cases it was necessary to suspend it for a few weeks, twice on account of gastro-enteritis, and once on account of severe stomatitis. One other case developed a fine scarlatiniform rash, which came up within twenty-four hours of each bismuth injection and gradually faded away during the remainder of the week. It caused her no inconvenience, and her treatment was not interfered with.

The average patient will stand three such courses during the first year of treatment and two during the second, and, if the patient can be given five such courses, the Wassermann reaction will be rendered negative in about 70 per cent. of cases. Many will be sero-negative much earlier; in this series over 80 per cent. of the cases began to show serological improvement by the end of the second course.

It must be remembered that these are cases of old-standing disease, often occurring in elderly subjects; for recent infections arsenical treatment is essential. I am convinced that in many of these old cases bismuth is even more efficient than arsenic, and that the safety, ease, and rapidity of administration, and its relative cheapness, render it of great practical value.

PUERPERAL SEPSIS.*

BY

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THE strict measures adopted at the Princess Mary Maternity Hospital, Newcastle-upon-Tyne, to prevent contagion produced vastly improved results; some details of these were published in the *British Medical Journal* of May 3rd (p. 814). It would not be fair to attribute all the improvement to the new routine; a "scare" regarding sepsis has a tonic effect on nursing in general.

There should be a larger proportion of fully trained nurses on the staff of maternity hospitals, especially for the nursing of suspect and septic cases. Clean and suspect cases cannot be nursed together; the former are endangered, and the latter tend to be neglected. The problem of isolation is one of great anxiety, as many maternity hospitals are quite unequal to the demand made on them. They were designed before the notification of puerperal pyrexia produced such an influx of febrile cases requiring hospital treatment, which at times tends to convert them into fever hospitals.

The following would appear to be the minimum requirements of a modern maternity hospital: (1) an admission room for preliminary classification; (2) examination rooms and wards for (*a*) clean, (*b*) suspect cases, (*c*) cases of genital sepsis, (*d*) cases of extragenital sepsis. Each of the four units should have its own labour ward and nursing staff.

The present method of recording morbidity in maternity hospitals is largely valueless owing to the indiscriminate grouping together of cases. The only reliable record is that made of clean cases that are delivered in hospital.

The periodic pyrexial wave among suspect cases admitted to hospital was studied from 1925 to 1930. When compared with clean cases (Group B), which have similar complications, but for whose safety from sepsis the hospital is primarily responsible, it will be seen that the outside cases have a higher sepsis curve, but that there is a degree of sympathy between the curves.

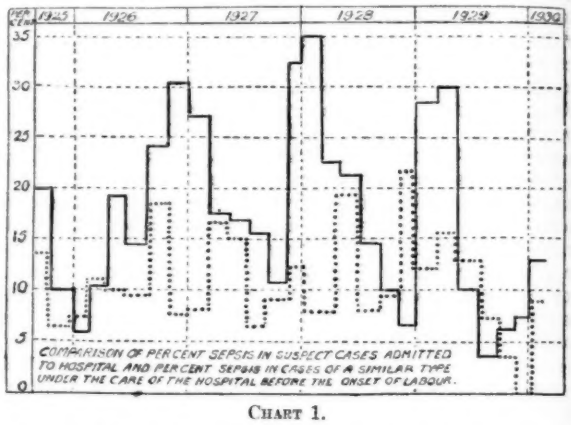

CHART 1.

Thick black line = percentage sepsis in suspect cases sent into hospital. Dotted line = percentage sepsis in Group B clean cases delivered in hospital.

In looking for the cause of these pyrexial waves, it seemed reasonable to exclude the hospital because, with its admitted defects during some of the years in question, there was no reason why its own cases should not follow a similar curve. The possibility of periodic overcrowding was excluded, as the numbers admitted, especially of suspect and septic cases, were remarkably constant.

Since the pyrexial waves occurred during the winter months, I wondered if, during periods of epidemics, doctors were perhaps too rushed to devote sufficient time to maternity work. This theory was investigated by studying certain types of cases which were sent in during the four months of highest pyrexia and the four months of lowest pyrexia for the years 1926, 1927, and 1928. Cases of "failed forceps," haemorrhages, abnormalities, and eclampsia were studied.

Suspect Cases.

	High Sepsis.		Low Sepsis.	
	No. of Cases.	Percentage Septic.	No. of Cases.	Percentage Septic.
Failed forceps ...	18	33	24	15
Haemorrhages ...	57	21	54	13
Abnormalities ...	50	32	77	10
Eclampsia... ...	18	39	22	10

The results of this investigation completely exonerated the profession. Not only did it reveal that the septic factor is one which is general and not selective, but—still more important—that a larger number of cases of failed forceps and abnormalities were sent in by doctors during periods when they were slack and when the sepsis rate was low than when they were busy and the sepsis rate was high.

* Summary of a paper read before the Edinburgh Obstetrical Society.

The seasonal character of the waves suggested that they might correspond to periods of general lowering of the individual resistance to infection. Dr. H. Kerr, medical officer of health for Newcastle, provided a list of deaths of both sexes occurring from influenza and pneumonia during the years 1925 to 1930. There is a marked similarity between the death curve and the sepsis curve (see Chart 2).

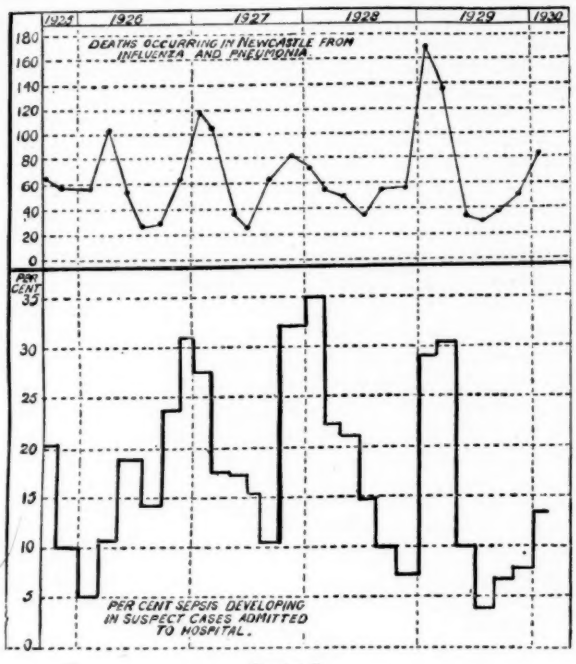

CHART 2.

The difference between the sepsis curve of cases sent into the hospital and cases of a similar character which have been under the care of the hospital remains to be explained. If the seasons or the hospital were entirely to blame, then the curves should have been identical. The following difference existed between hospital and outside cases.

High Sepsis.

	Hospital.		Others.	
	No. of Cases.	Percentage Septic.	No. of Cases.	Percentage Septic.
Haemorrhages ...	25	16	57	21
Abnormalities ...	59	9	50	32
Eclampsia... ...	8	Nil	18	39
Low Sepsis.				
Haemorrhages ...	21	8	54	13
Abnormalities ...	82	16	77	10
Eclampsia... .	4	Nil	22	10

With only one exception the hospital cases showed better results. This suggested that under existing conditions many patients of the industrial class do not get as good medical and nursing supervision as they obtain in hospital. It will be readily understood by anyone with a practical knowledge of the subject that cases sent to hospitals by doctors are not necessarily "doctors'" cases, and, even when they are, the doctor in charge has too frequently been without skilled nursing assistance.

Conclusions.

1. The liability to puerperal sepsis is greater at certain seasons than at others.

2. Its incidence can be considerably modified by proper medical supervision and adequate nursing attention.

RESPIRATORY COMPLICATIONS FOLLOWING SURGICAL OPERATIONS DURING A FOUR-YEAR PERIOD.*

BY

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THE subject of respiratory complications following surgical operations has been a source of worry to all concerned, while endless controversies have arisen as to the part inhalation anaesthesia plays as a causative factor. There was a time when almost every post-operative complication except haemorrhage was put down to the latent influence of the anaesthetic. The whole of the anaesthetic vapour necessary to produce anaesthesia passes through the lungs to the patient, while 90 per cent. is excreted by the same route; any abnormal post-operative lung trouble was so easily ascribed to "irritation" from the ether. "Time heals all things," and during the last decade the etiology of respiratory complications has changed; the extensive use of novocain for major surgical procedures, with subsequent pulmonary lesions, has brought forcibly to mind the realization that other factors besides ether irritation enter into respiratory complications.

"I have flowers from many gardens, but only the string which holds them together is my own." In the following analysis of lung lesions following a four-year period in a large general hospital, the only claim I make for originality lies in the compilation of data peculiar to this hospital and geographical situation, and I can only touch upon a few of the salient features.

Series of cases giving the pulmonary complications following surgical operations vary widely in the ratio to numbers of operations, so much so that comparisons are of limited value. An extensive review of the literature dealing with the subject varies in the interpretation of the end-results, yet there is agreement upon some points. Thus, for example, patients who undergo upper abdominal operations and those with gross sepsis have a high ratio of post-operative pulmonary trouble, as compared with patients free from gross sepsis and not submitted to abdominal operations. Considering the magnitude of modern surgical procedures it is remarkable that respiratory lesions are not more frequent.

STATISTICAL RETURNS FROM OTHER HOSPITALS.

For comparative purposes I am including a limited number of reports from other hospitals. These comparisons are not invidious, since such factors as climate, surgical technique, and the type of operation suggest a wide variation in the end-results.

Silk,[1] in 1897, reported 5,000 operations, 13 with respiratory complications. Of these 13 cases, 5 followed operations upon the tongue or jaws. Thirty years ago laparotomies were not entered upon so lightly as at the present day. Mikulicz and Henle[2] record that of 1,787 upper abdominal operations 143 (8 per cent.) were followed by lung lesions. Mikulicz asserts that as many respiratory complications follow after local as after general anaesthesia; Armstrong[3] in 2,500 major operations in Montreal reports 55 cases (2.2 per cent.), and Featherstone,[4] in a most exhaustive review of the literature, quotes 222 gastric cases from Birmingham, with a morbidity of 10.81 per cent. Whipple,[5] at the Presbyterian Hospital, New York, reported upon 3,719 patients, of whom 97 (2.3 per cent.) developed post-operative lung lesions. Elwyn,[6] from the wards of the Mount Sinai Hospital, New York, states that in 299 operations under some form of local anaesthesia 11 patients (2.7 per cent.) contracted some form of pulmonary trouble. In 1922 I published a brief survey[7] of 7,000 operations followed by 19 respiratory complications.

* A paper read in opening a discussion in the Section of Anaesthesia at the Annual Meeting of the British Medical Association at Winnipeg, 1930.

STATISTICS OF THE HOSPITAL.

The statistics now to be reported consist of 33,066 operations performed during the four years 1926–29; 31,301 operations were under general anaesthesia, and the remaining 2,765 were conducted under some form of local anaesthesia. According to the hospital records there were 55 respiratory complications with 23 deaths.

Methods of Induction.

Before going into a detailed analysis of these 55 cases a few words giving the pre-operative routine might not be out of place; probably about 65 per cent. of the patients would have a preliminary injection of 1/6 grain of morphine sulphate, combined with 1/150 grain of atropine sulphate. We rarely use large doses of morphine. Great care is exercised in excluding from operation patients with a cold or coryza, even if afebrile. In cases with a history of recent respiratory trouble or tonsillitis operation is postponed for two to four weeks.

More than half of this series received ether dropped upon a thick cotton fabric supported by a wire frame; a mixture of two parts of chloroform with three parts of ether was added in any operation where ether would not induce sufficient relaxation by itself. Nitrous oxide and ethylene were administered by McKesson machines; one in six would be a rough estimate of gas anaesthesia. Post-operative ward treatment varied widely according to the individual clinician. The gravity of the operation ranged from excision of a sebaceous cyst, and brief dental extractions, to thousands of appendicectomies and herniotomies, and severe operations upon patients with grave renal or cardiac conditions. The ages of the patients ranged from 4 days to over 90 years.

One feature which emerges most prominently when first looking at the morbidity of this series of cases is the number of patients with additional pathological changes to that for which the operation was designed to relieve. Kipling states: "Indeed when you come to think of it, had the British Army consistently waited for reserves in all its little affairs, the boundaries of our Empire would have stopped at Brighton Beach."

Nature of Cases with Ensuing Respiratory Complications.

Of the 55 patients with respiratory complications in this report, 13 had sequels of a minor nature, 7 infarcts, and there were 6 cases of pleurisy; the remaining 42 suffered from pneumonic processes. These 42 cases included 9 emergency operations; 16 patients (including 7 of the previously mentioned) had marked elevation of the pulse, temperature, and respiration at the time of operation. Nine patients were over the age of 60, and in 23 (more than half) the operation involved the gastro-intestinal tract, including herniotomies.

Another interesting point is the gravity of sepsis at the time of operation; 23 of the 42 patients with major complications died, and at the time of operation 19 of these 42 had gross sepsis. Of these 19 patients with sepsis, 14 died (73 per cent.). Twenty patients out of the 55 originally mentioned were first-class operative risks with one death; this may be compared with the 35 substandard patients with 22 deaths.

In 1929 of 1,772 abdominal operations (excepting 242 thyroidectomies), there were 6 respiratory complications with two deaths; both patients who died were over the age of 70, and the operations were emergency ones. In the same hospital in 1922, Dr. H. Morrison[8] reported upon 408 patients operated on for appendicitis, with one death from pneumonia. Broadly speaking, this report agrees with the ratio of respiratory lesions given for 1929—a morbidity of 6 in 1,772 cases.

The sexes were approximately equally affected in this series. Some writers have stated that respiratory complications occur more frequently in males than females, owing to the interference with the abdominal type of breathing rather than with the thoracic type characteristic of women. As regards age, each decade over 40 adds to the operative risk. Fair comparisons of the type of operation are difficult to establish. An American writer has stated that post-operative pulmonary complications occur in 14.8 per cent. of stomach operations, and in 5 per cent. of operations upon the gall-bladder, averaging altogether 7.7 per cent.

No definite conclusion can be reached as to the influence of the length of operation. A number of the poor risk patients had short anaesthesia periods and succumbed. It might be said, however, that the shorter the time under a general anaesthetic the less interference would there be with the vital processes of the body. Gas anaesthesias carried with them a higher ratio of pulmonary lesions than ether, but in many instances gas anaesthesia was given in preference to handicapped patients. Neuhoff[9] reports 500 necropsies following surgical operations. Pneumonia was diagnosed previously in 81 cases and found after death in 51 subjects, or 60 per cent. He states also that "a diagnosis of post-operative pneumonia in sick patients is fraught with difficulty, and the classical physical signs of pneumonia do not prove its presence in serious post-operative conditions." In addition, Neuhoff found pneumonia a much more common cause of death in clean wounds than in infected wounds; 11 per cent. in the former, 1.5 in the latter.

Theory of Lung Infection.

The splinting of the abdominal muscles due to pain in the wound and tight binders causes more or less circulatory stasis in the bases of the lungs. This area of stasis is invaded by infection passing up the lymphatics through the diaphragm. Collyros believes that atelectasis and pneumonia are different phases of the one process. He states: "In the atelectatic portion of the lungs the vessels exude a stieky secretion. This secretion prevents the passage of air, and consolidation follows; after consolidation infection follows so easily."

CONCLUSIONS.

1. Post-operative pulmonary complication is a serious hazard to recovery; 40 per cent. of the patients died in this series. Of 13 patients with elevation of pulse and temperature at the time of operation 11 died (84 per cent.).

2. Taking into consideration the number and gravity of modern surgical procedures, pulmonary complications following operations are less numerous than might be expected. In this series 15 per cent. of the patients were 70 years old, and 21 per cent. had elevation of the pulse, respiration, and temperature at the time of operation.

3. Sepsis (gross) at the time of operation is a greater risk than post-operative pneumonia.

4. Careful selection of patients, and pre-operative measures with equal attention to the matter of after-care, will keep the incidence of respiratory lesions down to the minimum, until such time as a definite cause is known for this dreaded operative sequel.

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THE INFLUENCE OF LACTATION ON OVULATION AND OESTRUS.

BY

J. T. CUNNINGHAM, M.A., F.L.S.

ACCORDING to Crew and Mirskaia[1] oestrus and ovulation occur in the mouse within twenty-four hours of parturition, and if no fertilization then takes place there is no second oestrus for an interval of twenty to twenty-five days, which is the normal duration of lactation. This interval, called the lactation interval, cannot be appreciably lengthened by prolonging the actual lactation by means of supplying new litters of young, but on the other hand, if the original litter is removed at a shorter interval—for example, seven or fourteen days after birth—oestrus recurs on the second to fourth day after such removal. They state that, according to the evidence of experiment, lactation causes the

corpora lutea of the first post-partum oestrus to persist, and that these corpora lutea inhibit oestrus during the lactation interval. The theoretical explanation proposed is that the stimulus of sucking acts on the anterior lobe of the pituitary, and that the excess of pituitary secretion so produced causes the persistence of the corpora lutea.

The weakness of this theory is that there are many mammals in which lactation does not inhibit oestrus. In the ungulates—the cow, mare, and sow—according to Parkes, lactation has no effect on the recurrence of the oestrous cycle, and therefore presumably on ovulation. In the human species the occurrence of menstruation during lactation seems to be quite common, but not without exception. In cases where there is no succession of short oestrous cycles the question of the effect of lactation does not arise: for example, in the dog pregnancy lasts about two months, and is followed by lactation for about the same period, and there is no recurrence of oestrus during all this time; but oestrus is also absent for a similar period when no pregnancy or lactation occurs.

The case of the ferret, recently investigated experimentally by Hammond and Marshall, is in strong contrast to that of the dog, though both animals are carnivores. Oestrus in the female ferret is marked by a conspicuous feature—namely, great swelling of the labia of the vulva. Ovulation occurs only after copulation and, in the absence of this, oestrus continues till the end of the breeding season. The duration of pregnancy is forty-one or forty-two days, and the recurrence of oestrus after parturition depends entirely on lactation. When the young were killed immediately after birth oestrus began nine days later, but while lactation continued there were no signs of it. Moreover, during lactation the corpora lutea do not remain large, as in the rat, but rapidly atrophy, as in the rabbit, from which it would appear that the influence of lactation in suppressing oestrus does not act through the medium of the corpus luteum.

Another instructive contrast is afforded by the rat or mouse and the guinea-pig. Both genera are polyoestrous, the cycle in the rat occupying five to six days, in the guinea-pig about sixteen. In the guinea-pig there is no lactation interval; there is, as in mouse or rat, an immediate post-partum oestrus, followed by a second at the normal interval of sixteen days, during lactation. As the suppression of oestrus only occurs in the mouse when more than two young are suckled the absence of oestrus-suppression in the guinea-pig has been attributed to the smaller number and greater maturity at birth of the young in this animal.

According to the results of O'Donoghue[2] and Hartman[3] the difference between the marsupials *Dasyurus* and *Didelphys virginiana* is similar to that between the dog and the ferret. The former is monoestrous, and ostrus is absent not only during the period of lactation but during the corresponding period when there are no young in the pouch. In *Didelphys virginiana*, on the other hand, in the absence of pregnancy oestrus recurs every twenty-eight days, but is suppressed during the whole of lactation, the young remaining in the pouch about fifty days. But if the young are removed from the pouch and destroyed oestrus returns ten to fifteen days later.

It is not possible to discuss details at greater length in such an article as the present, but enough has been stated to prove that there is no general correlation between the stimulus of sucking and the suppression of oestrus, as is assumed by the theory of Crew and Mirskaia. This correlation occurs in the mouse and rat, in the ferret, the rabbit, and the Virginian opossum, but it is absent in cow, mare, goat, pig, and frequently, if not always, in the human species. It seems to me that the really significant correlation is between the suppression of oestrus and the condition of the newborn young. In those cases where oestrus is inhibited the young are naked, immature, and kept for the greater part of the time enclosed in a warm nest in close contact with the mother. In the other cases where oestrus occurs during lactation, as in the cow and the guinea-pig, the young are born covered with hair and able to run almost at once. If the inhibition of oestrus were due to the absorption of soluble substances by the mother from the bodies of the young, either from the mouths of the latter through the teats, or from skin to skin, the correlation between the nidicolous immature condition of the young and the suppression of oestrus during lactation would be explained, while on the theory of the stimulus of sucking, since this stimulus occurs in the cow as in the mouse, there is no reason for the difference between the two in respect of oestrus during lactation. The case of *Didelphys* is especially important, for here the young are born after a gestation of only thirteen days in an early foetal stage of development, and are transferred to the pouch, where they become permanently attached to the teats. The skin within the pouch is naked, vascular, and glandular, and removal of the young from it has the same effect with regard to oestrus as removal of the foetuses from the uterus in higher mammals. The stimulus of sucking maintains the process of lactation in all cases, whether in the cow or the opossum, and it has been shown in the opossum and in the rabbit that the stimulus determines secretion, not in the whole system, but in each gland individually; but it is improbable that it affects the occurrence of oestrus.

How the hormones supposed to be absorbed on the theory I have suggested could affect the recurrence of oestrus, whether by acting on the corpora lutea or on the pituitary, is a matter for future investigation, but it may be mentioned that in most cases there is reason to believe that substances absorbed from the foetuses in the uterus determine the persistence of the corpora lutea. Considering the atrophy of the latter after abortion, it is a question whether it is the function of corpora lutea to maintain pregnancy, as frequently stated, or the effect of pregnancy to maintain the corpora lutea.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

FOREIGN BODY IN THE CAVERNOUS SINUS.

A CASE similar to the one here recorded was reported by J. F. L. King in the *British Medical Journal* of October 30th, 1926, where a woman fell on her face and struck her head against some wood outside her cottage door. Six pieces of wood were found in the cavernous sinus, and she died of meningitis, orbital abscess, and a cerebral abscess in the right temporal lobe. In the present case there was only septic meningitis.

A man, aged 40, was admitted into the General Hospital, Colombo, under the care of Dr. Lucian de Zilwa, with a history of fever of ten days' duration.

Some time ago he was walking in his garden when a coco-nut branch fell on his head, causing a small wound just above the inner canthus of his left eye. He was treated at the Victoria Memorial Eye Hospital, where the surgeon extracted a small piece of splinter and treated the external wound. In a few days he developed fever and headache, and later became very drowsy. He was then transferred to the General Hospital. Examination revealed a penetrating wound above the inner canthus of the left eye. He was semi-comatose, and did not answer any questions. There was bilateral proptosis; the pupils were dilated and inactive, the left being more dilated than the right. There was no paralysis. The lungs, heart, and abdomen were normal. Further examination could not be carried out as the patient died within two hours of admission.

Post-mortem Examination.—On opening the skull evidence was found of septic meningitis. There was a thin layer of pus over both hemispheres anteriorly—more marked on the left side. The left cavernous sinus was occupied by a thrombus, in which were embedded two pieces of splinter. One piece measured 1/2 inch by 1/5 inch; the other was smaller. Points of yellow material in the thrombus had been caused by suppuration. There was also a thrombus in the right cavernous sinus. Extravasations of blood and minute pieces of splinter were found along the floor of the left orbit. The eyeball was not damaged, nor were the orbital muscles. There was no fracture of the bones of the orbit.

The absence of damage to the eyeball was remarkable. The splinters must have been driven with considerable

force to have entered the cavernous sinus. The passage of the splinters was probably along the orbit through the sphenoidal fissure straight into the cavernous sinus.

I must thank Dr. Lucian de Zilwa for permission to publish this case.

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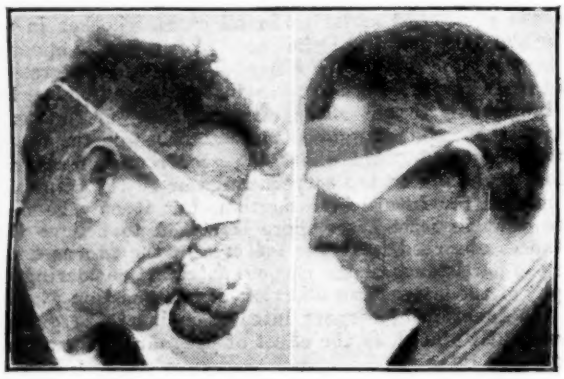
TREATMENT OF RHINOPHYMA.

THE remarkable improvement in a case of rhinophyma as the result of surgical intervention seems worthy of record.

A man, aged 47, had suffered from rhinophyma for ten years, but had not had medical advice because a friend had informed him that if anything was done he would bleed to death. He



was, however, recently persuaded to consult me, and I took him into hospital for an operation. Anaesthesia was induced with open ether; chloroform was then given with a Junker's apparatus.

Removal of the growth was effected with a scalpel, and presented no difficulty, the only neighbourhood requiring care being that around the nostrils, where the growth had invaded the nares, and new nostrils had to be fashioned. Haemorrhage, though free, was very easily controlled by swab pressure and a few forceps. The wound was dressed with acriflavine emulsion on gauze, and had quite healed in ten days, when the patient was discharged.

The most striking feature of the case was the change in the patient's morale. From having been afraid to go about, he is now a very happy, cheerful, and grateful fellow.

I am indebted to my partner Dr. R. H. Blair for the photographs of the condition "before" and "after."

Camborne. R. SHEARSMITH COLDREY, M.B., B.S.

A CASE OF SOMNIFAINE POISONING.

THE following case should be of interest to all who are accustomed to prescribe somnifaine in cases of insomnia, and to those who intend employing the drug.

At 7.30 p.m. on April 29th, I was called to see a man, aged 73, who had been found by the police lying unconscious in an open field, and had now been brought to a suitable place for treatment. A perfectly new 12 c.cm. bottle labelled "Somnifaine" was found empty beside him.

On examination his pulse was regular and normal in rate and tension, breathing quiet and normal, and eyelids closed. His pupils were slightly dilated, and the conjunctival reflexes were present. Any attempt at moving his arms or legs was feebly resisted. Strychnine 1/15 grain was injected hypodermically, and I left him in the charge of a nurse, stating that there was no cause for alarm.

Four hours after the injection the nurse reported that he muttered a few words, but relapsed into sleep again. Forty-eight hours after my first examination the man awoke slightly confused and very hungry, but otherwise none the worse for his protracted sleep. He admitted drinking all the somnifaine (12 c.cm.) at one go, but asked to be spared further questions "as it was a painful subject."

Somnifaine is supplied as a liquid hypnotic in 12 c.cm. bottles, and the label bears in small red lettering the word "poison," in accordance with Part I of the Regulations. "1 c.cm. contains 0.1 gram diethyl-barbituric acid and 0.1 gram allyl-isopropyl-barbituric acid in the form of salts of diethylamine." A medium dose is 25 drops, and I find by measurement that the man took eight times the medium dose.

N. C. HYPHER, B.A., B.Sc.,
M.R.C.S., L.R.C.P.
Slough.

Reviews.

CLINICAL RADIOLOGY OF THE ALIMENTARY TRACT.

THE first volume of the series of works on the clinical radiology of the gastro-intestinal tract, edited by Pierre Duval, J.-Ch. Roux, and Henri Béclère, was published in 1927, and dealt with affections of the stomach and duodenum. This work has recently been followed by two volumes which together form an atlas of the clinical radiology of the oesophagus, intestine, liver, and other accessory intestinal glands; the authors are Professor J. GATELLIER and MM. F. MOUTIER and P. PORCHER, all of the faculty of medicine of Paris.

The arrangement adopted by the authors is very convenient for the reader; in the text they give a full account of the methods used and of the disorders illustrated in the radiograms, and to each photograph they append an explanatory drawing with a brief description. The first volume opens with a study of the oesophagus. Among the radiograms are some showing slight variations from the normal, including unusual contractions; the appearances of compression from without: stenosis, cancer, diverticula, and fistulae; and a mega-oesophagus which held two to three pints of fluid. In the chapter on the jejunum and ileum, a part of the gut that often receives but scant attention, there is a good picture of an obstructing gall-stone in a loop of small intestine lying in the left iliac fossa.

The authors state that the right colon is normally a mobile organ, though the mobility may vary in degree, and show how volvulus of the caecum may arise from inversion, rotation, or transposition. Among the illustrations of abnormal positions of the caecum are some showing its penetration into diaphragmatic and scrotal hernias, and a skiagram of a case of congenital abnormality in which the right colon is seen to be situated entirely in the left side of the chest, the caecum being at the level of the apex of the left lung. A full account is given of redundancy of the sigmoid, the characteristic of which is regarded as length, whereas the distinguishing feature of megacolon is increased diameter.

In the second volume the authors discuss and illustrate the radiographic evidence of colitis. Their statement that there is no individual *x*-ray feature characteristic of this condition will not, we believe, meet with general acceptance, for many radiologists can recognize with certainty the disordered segmentation of colitis. The signs of colitis they classify as static and kinetic, the latter including abnormalities of filling, spasm, and disorders of emptying. The authors point out that spasm should be taken to indicate disease only when it is constant in different postures. Acceleration of the rate of passage occurs frequently, material arriving at the sigmoid flexure in nine hours and being evacuated within twenty-four. Static signs are short sigmoid segmentations, inhibition, a lessened diameter of the lumen, variable spasms, and areas of gas. The appearances resulting from adhesions are dismissed shortly, but the investigator in this field soon learns that the signs of fixation are only presumptive, not certain. The authors point out specially that a low position of the bowel is no evidence of immobility.

In discussing cancer of the colon the authors state that they find the barium meal valuable in establishing the state of the lumen—this is, the canalization. The enema is given with the patient in the prone position, on the assumption that the flexures are thus more readily passed; in some cases atropine is given to make the filling easier. Arrest of the head of the meal, they point out, is of little diagnostic importance unless it coincides with evidence of a tumour.

Nearly one hundred pages of text and pictures are devoted to the radiology of the accessory glands—namely, the salivary glands, the liver, the gall-bladder, the spleen,

[1] *Radiologie Clinique du Tube Digestif* (Clinical Radiology of the Alimentary Canal). Publiée sous la direction de P. Duval, J.-Ch. Roux, et H. Béclère. II. *Oesophage, intestin, foie et glandes annexes.* Par J. Gatellier, F. Moutier, et P. Porcher. Clinique Thérapeutique Chirurgicale de la Faculté de Médecine de Paris. Fasciculs I et II. Paris: Masson et Cie. 1930. (Roy. 4to, pp. 389; 416 radiographs, 407 figures. Foreign edition, 330 fr. the 2 volumes, bound.)

and the pancreas. The illustrations include skiagrams of biliary, renal, and pancreatic calculi *in situ*, with notes on their differential diagnosis, pictures of the biliary and pancreatic ducts, and an attractive plate of 79 radiograms of biliary calculi with a table of their relative densities. Most of the photographs are good, and many have unusual interest. The descriptions are carefully worded, and in some sections of the work are to be found facts and illustrations that would not be easily available elsewhere. These volumes are likely long to remain a standard work for radiologists and practitioners.

THE MECHANISM OF EVOLUTION.

PATHOLOGY as a factor in evolution should have a special interest for the medical profession. But it has been left to Mr. MORLEY ROBERTS to explore that avenue, and in *The Serpent's Fang*[2] he has further elaborated the views expressed in his earlier works *Warfare in the Human Body*, and *Malignancy and Evolution*. He is a sociologist turned biologist, which gives him a fresh and individual outlook; he is also a bonny fighter, and those who differ from him must expect some shrewd blows.

The sight of a viper on Exmoor stimulated an engineer to ask Mr. Morley Roberts how a serpent's fang became long, curved, hollow, and movable. That a mechanism so complicated could arise by the accidental addition of accident to accident, each minute and spontaneous, was too much for an engineer to believe. He would as soon have attributed the modern steam engine to a similar set of causes. Now there are many to-day who, faced with evolutionary theory, are in like case with that engineer. Here as elsewhere rigid orthodoxy is proving incredible, and is maintained by an act of faith rather than by reason. Dr. Russell Brain in his little book *Galatea, or the Future of Darwinism* (which was reviewed in our columns on June 16th, 1928, p. 1029), pictures the course of evolution according to Neo-Darwinians thus: "Imagine a company of people setting out from London and deciding their destination by opening at random the pages of Bradshaw, and taking a ticket for the first town on which their glance alighted. Suppose them to repeat the process on reaching their first destinations and assume that there is a law by which all who are unfortunate enough to hit upon a second town which is not on the same line as the first are forthwith executed." This would not appear to be a rational mode of locomotion, nor would it achieve much. But it would be simplicity itself compared with the course of evolution as pictured by rigid Mendelians and followers of Weismann. Can we really believe that mutations are fortuitous, and owe nothing for their origin to environment, when it is solely in relation to environment that they have any value? Mr. Morley Roberts cannot believe it. But he feels that if the strict Darwinian view is denied in favour of a modified Lamarckism, even this is itself incomplete, and must be added to. That Darwin himself, with his addiction to use and disuse, was more Larmarckian than he knew is nowadays quite clear. That natural selection is an exceedingly severe censor on unsuitable mutations is evident. That many critics of Lamarck neglect his insistence on the importance of the time factor must be admitted. But the whole question has been looked at too exclusively from the morphological standpoint, and the importance of function in determining structure has been disregarded: "For life *is* function." Perhaps Mr. Roberts is a thought too sceptical of genes and chromosomes, which he regards as mere tools with which the cytoplasm works. But the special contributions he has made to the theory of evolution are the conception that the tissues of the multicellular organism exist in a state of hostile symbiosis, and that breakdown and repair are important as forerunners of new developments.

Such views explain a great deal. If each tissue is competing within the individual body to obtain the best possible conditions for itself we can understand why the individual is himself the scene of conflict, why isolated cells, unrestrained by other tissues, acquire a positively malignant growth, and why a strong central nervous system is needed to maintain order. All this is in accord with Wilfred Trotter's demonstration of the way in which the nervous system insulates and virtually protects itself from its rebellious subjects in the soma. Further, if the effort to overcome obstacles is a recognized factor in development, surely the obstacle of disease must be one that most irresistibly calls out such effort. The last enemy that shall be overcome is death, and the approach of death by disease will be strenuously combated; successful combat is rewarded by new adaptations.

But if Mr. Morley Roberts finds the heaping of accident upon accident such an inadequate explanation, the reader must not suppose he believes in evolution by design. Far from it; he reserves his choicest satire for those who seek short cuts to a final explanation of the universe. Particularly does the abstract philosopher come under his ban. "There is much better work to be done in this world than to chop logic at the bar of the Absolute." He even dislikes Spemann's idea of a differentiator which determines the course of development, and it affords him "some gratification to link it up with that other fantastic quasi-deity, the 'censor' in the latest psychology." His last chapter, entitled "Obscurantism and Biology," affords entertaining reading, even though one may feel some sympathy for the victims of his lash. In Mr. Morley Roberts's view "to leave the laboratory bench and assume the mantle 'star-enwrought' of the metaphysician harms the whole cause of science."

He would push the scientific method as far as possible, and not have any commerce with attempts to solve the insolvable. But such attempts will always have their attraction for the human mind, although, as Dr. Charles Singer says, all the cosmologies which have been constructed to provide an explanation of the world become, in course of time, an obstacle where they were once an aid.

W. L. B.

[2] *The Serpent's Fang.* By Morley Roberts. London: Eveleigh Nash and Grayson, Ltd. 1930. (Demy 8vo, pp. 263. 18s. net.)

AMERICAN GYNAECOLOGICAL PRACTICE.

THE new edition of ANSPACH'S *Gynecology*[3] has been brought up to date by the inclusion of the most recent advances. The first part gives a complete account of the development, anatomy, and physiology of the pelvic organs, and calls for no special comment. This is followed by a survey of methods for the examination of patients, together with a general account of the significance of the various signs and symptoms that may be encountered, and is a section of the book that will be appreciated by medical students. The various gynaecological diseases are then considered one by one, each special organ being dealt with in turn. Syphilis, tuberculosis, and gonorrhoea have each a special chapter. A full account of operative technique and of post-operative treatment forms an important section of the book.

It is perhaps a pity that some less well-established methods have been given places in prominence equal to those which time has shown to be sound. At the present time the treatment of functional disorders of menstruation by administration of ovarian extracts can scarcely be regarded as standing on a satisfactory basis, yet in this textbook the limitations of their uses are not sufficiently pointed out. The more recent work on the diagnosis and treatment of sterility due to blocking of the Fallopian tubes is very fully considered, but here again a more critical attitude towards this branch of gynaecology would have been better. There is an excellent chapter on "backache," in which the importance of orthopaedic causes is stressed. Full consideration is paid to the diagnosis and treatment of such cases, and although the subject is, strictly speaking, outside the province of the gynaecologist, he is so frequently confronted with the symptom of backache that it is important to have a clear idea of all its causes. A short review of the part played by radium and deep x rays in the treatment of carcinoma, and in the production of an artificial menopause, is given at the end of the book, but in view of the importance of these methods the details of the technique employed might well have been fuller in a work as comprehensive as this.

[3] *Gynecology.* By Brooke M. Anspach, M.D. With an introduction by John G. Clark. Fourth edition, revised by the author with the assistance of Philip F. Williams, M.D. London: J. B. Lippincott Company. (Med. 8vo, pp. xvi + 752; 532 figures. 42s. net.)

The book is well written throughout, and although its outlook is typically American its clear enunciation of first principles may make it appeal to British students. As an account of established American practice it is very useful as a book of reference, and its value in this respect is enhanced by the inclusion at the end of each chapter of an extensive bibliography. The references, it is true, are drawn mainly from American and German literature, but this makes them the more valuable in this country. Like most American books, it is profusely illustrated, but on more careful consideration one wonders whether some of the illustrations might not have been omitted without loss to the clarity of exposition.

HYDROTHERAPY.

THE practice of hydrotherapy in a French institution is well described by Dr. DUBOIS DE SAUJON in a small book entitled *L'Hydrothérapie médicale*.[4] His is one of several special installations which are conducted under medical direction, and in which the treatment is often administered by the medical man himself. In this volume he gives a clear and brief outline of the physiological action on the organism of applications of water, and describes in detail the technique of making these applications both in the home and in the hydrotherapeutic institution.

Among the great variety of methods that should be available in the patient's own home the author enumerates: (1) the half-minute bath with frictions; (2) the very brief cold shower with frictions; (3) the cold pack with wrung-out cloths, the cloth being constantly rubbed to and fro upon the skin; (4) the pack with waterproof cover, for sedation and transpiration; (5) the half-bath of Winternitz with affusion and friction; (6) baths progressively cooled or heated; (7) footbaths with rising temperatures. The frequency with which frictions are enjoined is noteworthy. Adjuncts include thermo-resinous baths for rheumatic subjects, with profuse perspirations and copious water-drinking. The chief method at the establishment is the douche, which in its varied forms in France is admirably described—for example, cold, hot, alternating, with and without manipulation, general or localized to particular regions, precordial, hepatic, lumbar, plantar, etc.

A final section of the book gives in full detail the indications and contraindications of hydrotherapy in a variety of cases. The use of baths in fevers is carefully defined; a wide range is given for nervous diseases, forms of paralysis, neuroses, psychoses, Graves's disease, etc. The applications proper in cardiovascular, dyspeptic, and rheumatic cases are fully detailed, and the directions given for treating these varied conditions are practical and precise. The book itself is interesting and well arranged, and should serve as a sufficient guide to any medical man proposing to employ hydropathic methods in his own practice.

HEALTH OF CHILDREN IN THE TROPICS.

IN *The Care of Children in the Tropics*,[5] Dr. ERIC C. SPAAR has provided a manual which should be of great value to the mother faced with the problems of a hot country. The difficulties of feeding, clothing, and general management take on such a different complexion in the Tropics that the usual textbooks on child care either do not apply or are definitely misleading; and it is precisely to the points on which advice intended for temperate countries proves fallacious that Dr. Spaar has paid most attention. The book is divided into three sections, of which the first is concerned with the general management of the infant, the second with modern methods of artificial feeding, and the third with the care of the sick child. The importance of breast-feeding is emphasized, not only on physiological grounds, but because it affords the best chance of avoiding the enteritic infections which so often prove fatal to children in the East. The points to be observed in choosing a wet-nurse, and those on which an ayah requires close supervision, are set out in detail, and the chapters on artificial feeding have been made extremely clear and straightforward. The difficulties of obtaining clean cow's milk can only be surmounted, Dr. Spaar finds, by buying the cow. The final chapters on common ailments, though they should be an excellent guide to a sensible mother, may conceivably have the opposite effect on the nervous type, who, learning for the first time that headache may mean meningitis, and distended abdomen peritonitis, will weary the overworked doctor with false alarms. There can be no doubt, however, that the book successfully meets a need felt alike by the mother and the medical practitioner in the Tropics.

[4] *L'Hydrothérapie medicale*. Par R. Dubois de Saujon. Les Actualités Physiothérapeutiques. Paris: Gauthier-Villars et Cie. 1930. (Post 8vo, pp. x + 130. 15 fr.)

[5] *The Care of Children in the Tropics*. By Eric C. Spaar, M.D., B.S., M.R.C.P. Baillière, Tindall and Cox. 1930. (5¼ × 8¼, pp. xiv + 265; 1 plate. 7s. 6d. net.)

NOTES ON BOOKS.

THE second edition of *Recent Advances in Diseases of Children*,[6] by Drs. W. J. PEARSON and W. G. WYLLIE, appears less than two years after the first, and although "advances" in this branch of medicine have certainly occurred during the interval the changes in the text are more extensive than mere bringing up to date will account for. The "acid" and "alkaline" children of the first edition have undergone some modification into "neuro-arthritic" and "lymphatic" respectively, and, indeed, all the chemistry of the book has been carefully revised and loose terminology deleted. From the preface it may be deduced that this is largely due to "helpful criticism" by Dr. G. A. Harrison. Sections on encephalitis, on chest conditions, including asthma, and on skin tests have been considerably altered and brought up to date, while changes also appear in the sections dealing with chronic infection of the tonsils and adenoids, chronic abdominal conditions, and on congenital syphilis. Drs. Pearson and Wyllie acknowledge that they have purposely been provocative in this work, which still remains more a textbook than a mere record of recent advances. While there is much less cause for direct criticism in this second edition it still contains a great deal of material which is novel by reason of the authors' approach to the subject, and the book as a whole gives considerable food for thought.

The second edition of the *Slit-lamp Microscopy of the Living Eye*,[7] by Dr. KOBY, which is translated by Mr. Charles Goulden and Mrs. Harris, is considerably enlarged and improved in comparison with the first. The general arrangement of the text is preserved, but it has been amplified by inclusion of the very large mass of new observations which have been recorded since the book first appeared five years ago. The thoroughness with which Dr. Koby keeps abreast of current literature in this ever-enlarging field of clinical ophthalmological practice is no small achievement, and the value of his book is enhanced by his own observations and by the lucid expression of his own criticism or appreciation of the work of others. The number of illustrations has also increased very considerably, and although they fall short of the beauty of those found in the German atlases they are not lacking in clarity, and are all the more valuable in that the vast majority of them come from the author's own hand. The present volume is an already very useful book considerably improved.

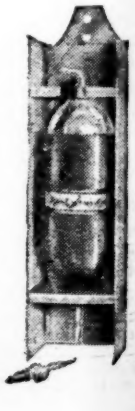
[6] *Recent Advances in Diseases of Children*. By Wilfred J. Pearson, D.S.O., *M.C.*, D.M., F.R.C.P., and W. G. Wyllie, M.D., M.R.C.P. Second edition. London: J. and A. Churchill. 1930. (5¼ × 8¼, pp. x + 584; 34 figures, 20 plates. 15s.)

[7] *Slit-lamp Microscopy of the Living Eye*. By Dr. F. Ed. Koby. Translated by Charles Goulden, O.B.E., F.R.C.S., and Clara Lomas Harris, M.B. Second edition. London: J. and A. Churchill. 1930. (Demy 8vo, pp. xvi + 360; 104 figures. 15s.)

PREPARATIONS AND APPLIANCES.

APPARATUS FOR INTRAVENOUS TRANSFUSION.

THE Crookes Laboratories have prepared a series of solutions suitable for intravenous transfusions, each put up in a special glass container and ready for use in emergency. The containers, as will be seen from the accompanying illustration, are ampoule-shaped, and have at one end an air inlet to which an air filter can be fitted by means of a short rubber tube, and at the other an outlet tube which, when the apparatus is required for use, is connected to a cannula. The standard aseptic solutions at present available are gum saline, hypertonic saline, normal saline solution, and normal glucose. The transfusion ampoule is supported in a metallic holder, so designed that it can be suspended over the patient's bed or near the operating table. A small pamphlet giving full particulars may be obtained on application to Crookes Laboratories (22, Chenies Street, London, W.C.1).



The Sections.

SUMMARY OF PROCEEDINGS.

(*Concluded from page 487.*)

SECTION OF OBSTETRICS AND GYNAECOLOGY.

Friday, August 29th.

THE PLACENTAL HORMONE.

THERE were 229 present when, under the chairmanship of Mr. COMYNS BERKELEY, a paper entitled "The placental hormone 'emmenine'" was read by Professor J. B. COLLIP (Montreal). In summarizing his work in the *Canadian Medical Association Journal* (1930, xxii, 761) he had, he said, drawn the following conclusions. There were three distinct active principles or hormones in the placenta which were alike, in that they had all been observed to be oestrogenic in the immature female rat. "Emmenine" was the active principle in the second fraction (85 per cent. alcohol-soluble), and was very similar to oestrin in its ultimate physiological effects. It was ineffective, however, in the castrate, and hence it might be concluded that it functioned directly or indirectly by stimulation of the intact ovary. Also it differed from oestrin in the degree to which it was effective by oral administration. The third fraction, prepared from the alcohol-insoluble material of the original extract, was similar to the other two in that it was oestrogenic, but differed from the "emmenine" fraction on three points: (1) it was ineffective by the oral route; (2) it produced corpora lutea in the immature rat coincident with induced oestrus; (3) it caused an increase in the rate of growth of the accessory sex glands in the immature male. As yet he had been unable to obtain with certainty any of the above fractions other than oestrin from pig and cow placenta, and this observation, which must be studied further, suggested that in the human placenta hormones existed which were absent in the lower mammals. This suggestion received support from the observation that pregnancy urine of certain of the lower mammals has failed to give an Aschheim-Zondek reaction when injected into immature mice. He considered the two oestrogenic placental hormones other than oestrin ("theelin") to be the counterparts in placenta of the "prolan A" (oestrogenic) and "prolan B" (oestrogenic and luteinizing) of urine described by Zondek and Aschheim. He was also of the opinion that these active principles were the specific products of placental tissue functioning, and were actively related to the condition of pregnancy. Much more research was necessary before we could correlate the functional interrelationship between the pituitary sex hormones and those of the placenta.

Mr. COMYNS BERKELEY, having drawn the attention of the meeting to the profound biological researches of Dr. Collip, particularly in connexion with the establishment of a workable manufacturing process for the isolation of insulin and the parathyroid hormone, said that this new work in the field of sex hormones was a great advance, and would be of immense value when the results could be accurately interpreted. Dr. A. D. CAMPBELL (Montreal) related a series of cases in which "emmenine" had been given therapeutically in various derangements of menstruation. He considered that the periodicity of menstruation was due to a hormone released from the anterior pituitary gland, but that alterations were usually due to ovarian derangements. He found that "emmenine" did not disturb the normal menstrual cycle, that its exhibition in cases of primary and secondary amenorrhoea had little effect, but that in epimenorrhagia the intervals were appreciably lengthened. The best results were obtained in cases of dysmenorrhoea, which were nearly always relieved, but the effect was not permanent, and on discontinuing the administration the symptom recurred. He had never found that abortion was brought about when the hormone was administered to a pregnant woman. Professor W. W. CHIPMAN (Montreal) said that while this was only a preliminary report on the work of production and use of "emmenine," the results were so far satisfactory, and should stimulate further investigation. He said that the placenta, which was really an ovarian tissue, and the ovum were dependent on one another, and probably the placenta was the storing-ground for ovarian hormones, and not the site of origin of specific hormones. Professor V. J. HARDING (Toronto) said that much confusion had arisen from the multiplicity of hormones present in the ovaries, and that he was struck by the fact that overdoses of "emmenine" had no deleterious effects, in contradistinction to the results from overdosage with other endocrines; this was probably because "emmenine" acted as a sort of pre-oestrin, stimulating the production of oestrin. He had found improvement in cases of vomiting of pregnancy by the administration of "emmenine."

TREATMENT OF PROLAPSE.

Mr. T. G. STEVENS (London) then gave a very clear demonstration on the operative treatment of prolapse, defining the principles and technique he had used in the treatment of 1,800 cases. This closely followed the teachings of Donald and Fothergill of Manchester, but in the anterior colporrhaphy he made a vertical mid-line incision and carefully dissected the bladder from the cervix, which was supported by mattress sutures inserted in the parametrium. He considered that amputation of the cervix was performed far too frequently, and he only carried out this part of the Manchester operation when there was marked hypertrophy or mobility of the cervix. He only added a laparotomy when there was a persistence of symptoms, or retroflexion or some abdominal complication associated with the prolapse. He treated the rectocele by a straightforward posterior colporrhaphy, commencing at the top of the vagina, and never considered it necessary to open the pouch of Douglas to treat the hernia occurring here. The operation was discussed, with general agreement on the main principles, by Mr. COMYNS BERKELEY, Mr. C. D. LOCHRANE (Derby), and Professor JOHN FRASER (Montreal). Mr. Lochrane said that he did not find it necessary to separate and dislocate the bladder upwards in most cases, and that this procedure was called for only when a relatively high amputation of the cervix was needed, in cases of definite cystocele without much descent of the uterus, and in a majority of post-menopausal cases in which the corpus uteri was markedly retroverted and bulky. In cases of the latter type the procedure was helpful in allowing the suture of the lower part of the corpus uteri to the anterior vaginal wall to maintain the uterus in an anteverted position.

ANAESTHESIA AND ANALGESIA IN CHILD-BEARING.

The concluding discussion of a long session was opened by Dame LOUISE MCILROY, who, in the course of her remarks on the position of anaesthesia and analgesia in child-bearing, said that there was much interest in the subject at present in England. Public discussions were taking place, and funds were being raised for the establishment of special resident anaesthetists in the maternity departments of the large hospitals. The medical profession was anxious to relieve suffering, but painless labour could not be achieved artificially without some risk to the mother, and more especially to the child. Anaesthetics were always given in maternity operations, and as a rule in complicated deliveries, but the medical profession had to solve the problem, How far with safety could freedom from pain be procured? Much more could be done to relieve pain than had been done hitherto. If every woman was to have anaesthetics, this would involve longer attendance by the medical practitioner, and therefore more expense. Skilled anaesthetists would be required to assist at the confinement. Anaesthetics tended to prolong labour, and there was much discussion on the most suitable drugs that should be employed as sedatives during the stages of labour, and the most suitable anaesthetic for delivery. The use of drugs diminished fear and shock, and therefore was a factor in the reduction of maternal mortality. Operative intervention was also prevented by the use of analgesics, as the patient and her relatives were not harassed by the sufferings of a prolonged labour. Turning to the actual consideration of the drug to be used, she said that morphine in small doses was most beneficial, but had to be used with skill and caution, as it might have a harmful effect upon the child. Morphine was frequently

combined with scopolamine. In very few cases was twilight sleep fully induced in England, as it involved special skill and surroundings for its administration. Chloral hydrate, with or without potassium bromide, was the favourite sedative in use. It was safe and easy to give. For the latter part of labour chloroform or ether was given at intervals, and deeper anaesthesia during delivery. The majority of obstetricians preferred ether, but chloroform had many advocates. Chloroform was unsafe in cases of toxaemia, such as eclampsia, or in heart disease. Ether was irritating in its effect in cases of lung complications. The safest and best anaesthetic was nitrous oxide gas and oxygen. It, however, required to be given by a trained anaesthetist, and it necessitated carrying about cumbersome apparatus. Various local and spinal analgesics were being employed, but opinions differed on the advantages and disadvantages of each. The conclusions arrived at by Professor McIlroy were as follows. Every maternity case must be given individual attention with regard to the most suitable sedative and anaesthetic to be employed. The age, parity, temperament, general health, and complications all had to be carefully considered. Obstetrical anaesthesia was not comparable with surgical. The pain was prolonged, and had to be combated with sedatives as well as anaesthetics. The effect of these sedatives had to be taken into consideration when an anaesthetic was decided upon. Light anaesthesia was of little use in surgery, while it was generally employed in midwifery practice except in cases where operative intervention was required. It was important that the action of the uterus should be maintained and haemorrhage after delivery prevented. Time and cost were considerations. Private patients should have the continuous attendance of the practitioner during labour if sedatives or anaesthetics were to be given, just as patients had in hospital practice; yet it was impossible to demand this unless adequate payment was made by the patients.

SECTION OF SURGERY.

Friday, August 29th.

THE SYMPATHETIC NERVOUS SYSTEM.

AT its final session the Surgical Section considered various aspects of the physiology and the surgery of the sympathetic nervous system. Dr. W. J. MAYO (Rochester, Minnesota) opened the discussion by giving an historical account of the discovery of the anatomy and physiology of the sympathetic ganglia and rami, mentioning the contributions of Winslow, Petit, Haller, Remak, Müller, Claude Bernard, Gaskell, and the work of the Cambridge school. He pointed out that the surgical approach to the sympathetic involved the wider problem of the relation of this system to the endocrine glands. Dr. Mayo was unwilling to admit that removal of a single adrenal gland caused any permanent disturbance in the physiology of the organism, and he therefore questioned the wisdom of such a procedure in patients suffering from high blood pressure. In closing, he referred to the effect of ramisection on conditions such as arthritis, Raynaud's disease, and Buerger's syndrome, and asked whether coronary disease might not be an end-result of a similar vasospastic process, and whether early sympathectomy might not prevent the onset of angina pectoris and allied disturbances.

Dr. N. D. ROYLE (Sydney, N.S.W.) then followed with a paper entitled "The clinical results following the operation of sympathetic ramisection," in which he stated that he had performed the operation six hundred times with a mortality rate of 0.5 per cent.—that is, with three deaths. The operation was introduced by him originally in 1923 for the treatment of spastic paralysis, and, excluding extrapyramidal conditions, 70 per cent. of the patients so treated had been distinctly benefited. A large proportion of them had been followed carefully and end-results were summarized. More recently Dr. Royle had used the operation experimentally for treatment of the following conditions: Parkinsonian rigidity (results poor); Hirschsprung's disease (results excellent in all cases); sarcoma of the femur (relief of pain); Raynaud's and Buerger's diseases (results gratifying, but better in the former condition); writer's cramp (one case, relief); poliomyelitis (results poor); conditions simulating tic douloureux (one case); retinitis pigmentosa (five cases, recovery of vision following extirpation of thoracic sympathetic). The most important new development related to Dr. Royle's discovery that retinitis pigmentosa responded to sympathectomy to a degree that caused the recovery of 20/30 vision in one patient whose visual acuity had previously been reduced to shadow perception. Dr. Royle still enthusiastically favoured the operation of ramisection in cases of spastic paralysis.

Dr. J. F. FULTON (Oxford), who discussed the physiological basis of the surgery of the sympathetic system, described first the relation of this system to the general physiology of the organism, mentioning Claude Bernard's prediction that regulation of the internal activities of the animal body was carried out by the nervous system, and alluding to the recent discovery that the centres of the autonomic system lie in the hypothalamus (Beattie and Long and their co-workers). In discussing the mechanism of postural responses Dr. Fulton pointed out that the stretch reflex, which was at the basis of posture, was not abolished by sympathectomy, though the transient diminution in rigidity occurring in spastic cases after ramisection suggested that the operation might cause an increase in threshold for eliciting the stretch reflex. From the physiological point of view justification for the employment of ramisection in cases of hypertonia was an open question. The operation of periarterial sympathectomy was without anatomical or physiological foundation. There were no long vaso-constrictor fibres passing distally in the larger arteries. The operation might, however, be useful for the relief of intractable pain. Apart from certain visceral conditions, such as Hirschsprung's disease, the only clear-cut indication for sympathectomy was ischaemia. Any pathological process in which healing would be greatly accelerated by an increased blood supply offered an indication for ramisection, especially if the morbid process threatened the existence of an extremity. Since collateral circulation in a limb was established more readily after ramisection than with vaso-constrictors intact, an extremity in gangrene from thrombosis should not be amputated without first giving it the benefit of ramisection. It was emphasized that conditions improved by sympathectomy were not due necessarily to hyperactivity of the sympathetic.

Dr. J. R. LEARMONTH (Rochester, Minnesota) emphasized that the action of both parasympathetic and sympathetic nerves upon the bowel and bladder should be regarded as a means of harmonizing an important physiological necessity—the disposal of the waste products of the body. Operations upon the sympathetic nerves of the bowel were indicated in cases of nervous imbalance, such as Hirschsprung's disease, and constipation due to dulling of the defaecation reflex. He described a new operation by which the whole sympathetic nerve supply to the lower colon, the rectum, and the internal anal sphincter could be interrupted, with preservation of the vasomotor nerves to the limbs. In the case of the bladder, he described two cases in which defective micturition, due to lesions affecting the parasympathetic pathway, had been rectified by division of the sympathetic nerves to the bladder, and advanced the hypothesis that these nerves might mediate an inhibitory action on the musculature of the human bladder. He also described cases of vesical dysfunction which had been benefited by removal of agents compressing the dural sac under a lumbar or sacral spina bifida occulta. The operation of total denervation of the bladder was also referred to and the indications for performing it were discussed.

Dr. R. B. WADE (Sydney, N.S.W.) gave a commendably critical report of progress concerning the treatment of Hirschsprung's disease. He had carried out left-sided lumbar ramisections for this condition in fourteen cases, and had had striking improvement in all but one, with the establishment of regular bowel movements and normal control of the anal sphincter. The unsuccessful case responded temporarily, however, when the rami on the right side also were sectioned. The unilateral operation

had been employed in many cases of chronic constipation with satisfying results.

Dr. WILDER PENFIELD (Montreal), in a paper entitled "Vascular changes observed in the brain during epileptiform seizures," mentioned at the outset that he had been able to demonstrate small medullated nerve fibres supplying a large proportion of the cerebral blood vessels; three cases of epilepsy were then described in which, during exposure of the brain under local anaesthesia, sharply circumscribed areas of anaemia appeared at several points in and about the motor area in the course of several carefully studied focal seizures. In the second case one of the recorded seizures consisted merely of clonic twitching of the eyelids and turning of the eyes to the right, and the seizure was associated with an isolated area of chalky pallor in an area corresponding to the frontal eye field. In some circumstances the larger cerebral arteries were seen at several points to constrict sharply, giving a beaded appearance to the whole vessel. Dr. Penfield concluded that since stimulation of the sympathetic nerve caused such extreme vasomotor activity, the cerebral vessels must receive some innervation other than the sympathetic, and therefore that surgical extirpation of the sympathetic in epilepsy was of doubtful value.

Dr. A. W. ADSON (Rochester, Minnesota), who dealt with indications for, and the therapeutic value of, sympathetic ganglionectomy and trunk resection in the treatment of peripheral vascular diseases, mentioned the two existing theories concerning the origin of Raynaud's disease; one, upheld by Lewis, who maintained that the vascular spasm was due to a purely local condition in the tissues affected, while Dr. Adson and others contended that the disease resulted from hyperactivity of vaso-constrictor reflexes, and that the fault therefore lay in the central nervous system. The speaker pointed out that in his cases, after complete removal of the vaso-constrictors supplying the lower limb, it was impossible to evoke vasomotor spasm, however intense the stimulus. The occasional persistence of spasm in the upper extremities was attributed to failure to remove all fibres. The more favourable results from the radical procedure recently introduced for the upper extremity supported this inference. At the Mayo Clinic the suitability of a case for operation was determined by a "vasomotor index"—that is, the ratio of the rise of temperature in the extremities to that in the mouth in fever produced by injection of typhoid vaccine. Dr. Adson had also proved that retinal arteries dilated after thorico-cervical ramisection. In concluding, he showed his first case of Raynaud's disease operated on five years ago, which had remained free from symptoms during that period, and also a case of Buerger's disease in which the morbid process had been successfully arrested in the upper extremities two years previously.

At the end of the discussion Lord MOYNIHAN read a paper by S. H. HARRIS and R. G. S. HARRIS of the urological department of the Lewisham Hospital, Sydney, on renal sympatheticotonus and renal sympathectomy. This operation was introduced in the hope of relieving certain obscure cases of persistent renal pain. Details were given of the nerve supply of the kidney, the operative technique for denervation of the kidney, and the indications for the new procedure. Pain associated with delayed emptying of the renal calyces and pelvis, together with dilatation of the pelvis, constituted the chief positive signs. The writers proposed to consider at a later time the relation of this operation to nephritis and essential haematuria.

In the discussion which followed, Dr. ROBERTSON (Toronto) described a case of spastic paralysis operated on in his clinic by Dr. Royle three years ago in which the result was distinctly favourable and had remained so. He also mentioned several cases of arthritis and of Hirschsprung's disease which had been successfully treated by ramisection. Dr. FLOTHOW (Seattle) said that he had seen Dr. Royle's cases in Australia, and could confirm his claims. He then described a case in which some months after lumbar ramisection a cervical ganglionectomy was performed, and during the general hyperthermia (108° F.) which followed, the lower extremity, whose lumbar sympathetic chain had been removed, showed evidence of extreme vaso-constriction. In a happy speech Lord MOYNIHAN drew attention to the high level of the discussion, and pointed out its relationship to the development of surgery in the past fifty years. Following upon the revolution effected by the work of Lister, surgeons had concerned themselves with the restoration of mechanical disorders by mechanical means. Surgery was now entering an era which might aptly be termed an era of physiological repair. The divorce of physiology and anatomy that supervened at the close of the career of Sharpey had been unfortunate, and its ill effects had persisted up to the present time. Lord Moynihan, however, seemed to discern the restoring hand of the surgeon. The synthetic action of surgeons, begun by Dr. Royle, was bringing physiology and anatomy together again, not by means of animal physiology, but by means of human physiology. The inaugural symptoms of disease should be studied by those who were conversant with normal physiology rather than with the pathology of the post-mortem room. For the philosopher this was the lesson offered by the day's meeting.

SECTIONS OF MENTAL DISEASES AND NEUROLOGY AND MEDICINE.

Friday, August 29th.

ACUTE POLIOMYELITIS.

LORD DAWSON OF PENN, President of the Section of Medicine, acting as chairman, took the opportunity, as it was the last meeting of the Sections, of thanking all officers for their untiring efforts in making the meetings the success they had undoubtedly been. Sir FARQUHAR BUZZARD, in opening the discussion, considered it fitting that the subject of acute poliomyelitis should be discussed in Canada, not only because the Dominion had been visited by severe epidemics of the disease, but because its public health authorities and medical profession had compared very favourably with those of other countries in the enlightened and progressive policy for combating the disease. Referring to epidemics of recent years and the work that had been done in dealing with the situation, he concluded that there was little doubt that, in the organized employment of serum therapy, a definite forward step in communal preventive medicine had been made, and that as a result many limbs and lives had been saved. For a number of years it had been held that the virus of poliomyelitis entered the central nervous system from the respiratory mucosa via the perineural lymphatics, as in tetanus, rabies, and diphtheria, and that it reached the grey matter to set up an acute inflammation of the interstitial tissues. This mode of spread, it was thought, would explain both the pathology and the clinical course of the disease. Recent research on experimental animals by Fairbrother and Hurst tended, however, to disprove this theory, and suggested that the axis cylinders were the chief routes of transmission of the infective agent. Before accepting this revolutionary doctrine as applicable to human poliomyelitis, the speaker felt that further critical examination was necessary, as the theory did not fall in line with the anatomical and symptomatic features of the illness as they were known. The question was more of academic than of practical importance, however, and there were many others more urgently needing solution. One of these the speaker thought to be the possible modes of propagation in the community. Direct contact and spread by respiratory droplet infection was accepted as a possible, though uncommon, mode of transmission, but that carriers were largely responsible for epidemics was more likely. Until we had more practical methods of testing and distinguishing between natural and acquired immunity, the problem was not likely to be solved. There was no doubt that immunity was frequently acquired by the response to infection with the virus without affection of the nervous system, and it was impossible with our present knowledge to estimate the activity of such carriers in spreading infection. The chief methods of propagation were contact with acute cases, healthy or unhealthy carriers, and occasionally foods such as milk. The hypothesis that some of

the obscure febrile illnesses of children were really attacks of poliomyelitis, and that increasing immunity among adults could be so explained, had not been proved, but it was pointed out that if a test for the virus in all cases of pyrexia of unknown origin could be established, the first step towards the truth would have been made. According to Collier, epidemics of poliomyelitis were preceded by "carrier epidemics," and, in congested communities, acute cases of the disease developed rapidly about the same time, having all been infected by carriers. If this was correct, there would be little need for isolating acute cases of the disease. However, there was not general agreement on this subject, and certainly not sufficient evidence to justify the exposure of healthy children to others suffering from the disease. Detection and control of the "carrier" would appear to be the most important step in preventing epidemics, but when the present status of prophylaxis and treatment was reviewed, we were faced with so many doubtful and misleading factors that no dogmatic statement could be made; further progress would depend on advances in knowledge of the virus. There was still some doubt as to the causative agent in spite of the apparently successful attempt by Flexner and Noguchi to cultivate specific globoid bodies. The absence of a specific test for recognizing early and abortive cases made this gap in our knowledge a serious obstacle to accurate statistics. The importance of the use of convalescent serum could not be overestimated, but who could predict what would have happened in the absence of such therapy? Other methods of treating acute poliomyelitis had been tried with no more positive results, and one was forced to the conclusion that further advance could not be made until a biological test ensuring early diagnosis had been discovered. For this purpose the speaker suggested that an exhaustive study of all pyrexias of unknown cause in children would be necessary. In conclusion, he mentioned the period of reparation as the one in which the orthopaedists of late years had minimized the tragic disablement of infantile paralysis, and it was, he thought, one of the brightest chapters in the recent history of the disease.

Professor H. B. CUSHING (Montreal) followed by giving an historical sketch of epidemics in Canada and the development of convalescent serum therapy. The efficacy of its use, he felt, had been positively proved by the following arguments in its favour: (1) it was analogous to serum treatment in other diseases; (2) in animal experimentation it had been shown that small doses of the serum produced immunity to large doses of the virus; and (3) it had withstood the clinical test. It had, however, the following limitations: (1) satisfactory immunity was of short duration; (2) serum was effective only in the pre-paralytic stage; (3) serum, being ahuman, was difficult to obtain in sufficient quantity. During epidemics, health departments in Canada had found communities anxious to co-operate. At Montreal, during the past epidemic, cripples for miles round had written to the health department offering to come at their own expense to supply serum, if required. In concluding, the speaker said that he held no special brief for convalescent serum, but he would like to impress on health authorities the extreme importance of always having on hand a sufficient supply to meet any possible emergency. At this time Lord Dawson of Penn vacated the chair to Dr. Edmund I. Spriggs (North Wales), Vice-President of the Section of Medicine. Dr. J. M. MCEACHERN (Winnipeg), following, stated that it was his privilege to speak on behalf of the Medical Research Committee of the University of Manitoba, and therefore on behalf of a large number of workers who, under the able leadership of Professor C. R. Gilmour, had made a special study of the extensive epidemic in that province in 1928. Possibly the most important results to be presented were those obtained by convalescent serum therapy. The method was not new, and the evidence in its favour was not conclusive; but since it was for the first time used extensively and intensively in Canada in the 1928 epidemic, the results had received some attention. Over 8,000 c.cm. of the serum, prepared under the direction of Professor F. T. Cadham, had been used during the Manitoba epidemic. The intramuscular method of administration was used almost exclusively. It had been the committee's experience that the serum was practically useless except in the pre-paralytic stage, hence the importance of being able to recognize the prodromal symptoms of the disease. Of the 435 cases recorded during the epidemic, 161 had been selected for the purpose of estimating the value of serum therapy. The basis of selection had been (1) a positive diagnosis, and (2) the accuracy and completeness of records obtained. The series had been divided into the following groups: (1) cases which received one dose of serum intramuscularly in the pre-paralytic stage; (2) those which received two or more doses by various routes in the pre-paralytic stage; (3) those which received serum after the onset of paralysis; and (4) those which received no serum. The following table, which was shown on the screen, illustrates the outcome in each group:

Group.	No. of Cases.	Completely Recovered.		Residual Paralysis.		Deaths.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
1 ...	57	53	93	4	7	0	0
2 ...	17	16	94	1	6	0	0
3 ...	33	7	22	15	45	11	33
4 ...	54	14	26	34	63	6	11

In concluding, the speaker stated that the committee, as a result of its work, was convinced of the value of convalescent serum in poliomyelitis. Dr. GEORGE RIDDOCH (London), following, said that his whole interest in the discussion centred around the research work done in Canada and the use of convalescent serum. He was convinced that it should be employed more extensively in Great Britain. He agreed with Sir Farquhar Buzzard that isolation of the causal agent was most important. Dr. ALEXANDER GIBSON (Winnipeg), speaking for the orthopaedic division, followed by saying that there was no work in orthopaedic surgery more gratifying than that of reparation in cases of poliomyelitis. These cases illustrated the necessity for co-operation between the different specialties; specialists were too prone to confine their interests in watertight compartments. The discussion, so far, had centred round the acute phase of the illness, and from what he had heard the speaker concluded that if serum were more extensively used the work of the orthopaedist would be much lessened. No one knew to what extent recovery might occur, but it was the duty of the orthopaedist, after the acute phase had passed, to prevent distortion. Massage and electrical treatment should not be prescribed; muscles were best left alone, except for the stimulation of "skin stroking." After outlining briefly orthopaedic measures for preventing contracture of muscles, the speaker concluded by saying that the more that was accomplished by those working on the problems of immunity, the less there would be for the orthopaedists to do. Dr. R. G. ARMOUR (Toronto) said that an aspect of the disease which had always impressed him as important was the frequency with which gastro-intestinal symptoms occurred during the pre-paralytic stage. He referred to a series of cases studied by him in New York in 1911. It had been noted in this study that where a large dose of castor oil had been administered early in the disease the acute phase was never so severe, and the sequelae never so serious, as in cases not so treated. From this he concluded that any case of diarrhoea and vomiting might be a case of poliomyelitis, and that castor oil should always be given. Another therapeutic measure which had not been mentioned was rest during the acute stage. Absolute rest during this period tended to lessen the spread of congestion in the spinal cord, and thus lessen the severity of sequelae. During poliomyelitis epidemics it was noteworthy that there were always a number of illnesses diagnosed as intestinal influenza. Might not these be cases of poliomyelitis in which there was no paralysis? Sir FARQUHAR BUZZARD, in replying, complimented the Sections on the fruitfulness of the discussion, and stated that he agreed with all that had been said. He wished to emphasize the importance of Professor Cushing's statements about the

need for health departments always to be forearmed. He was much interested in Dr. Gibson's remarks, and agreed with his views regarding the ill effects of massage and electrical treatment on sequelae. He thought that swimming should be more universally employed as a remedial measure, and referred to the good results obtained by swimming exercises for a group of paralytics which he had had under his care during the war. He agreed with Dr. Armour that gastro-intestinal disturbances were common, but not universal. The transportation of poliomyelitis cases during the acute stage was extremely dangerous, and he agreed with the speakers who had stressed the importance of rest during the acute stage of the disease.

SECTION OF DISEASES OF CHILDREN.

Friday, August 29th.

Disorders of Sleep in Childhood.

With Dr. Robert Hutchison in the chair, Dr. Hector Cameron (London) opened a discussion on disorders of sleep by remarking that no more was known of the physiology than of the pathology of this condition, and therefore up to the present clinical observation had been the only help to the study of the subject. He dealt with four types: (1) sleeplessness and continuous crying in young infants; (2) sleeplessness in older children; (3) night terrors; and (4) nocturnal enuresis. In the first type he considered that there were three factors—pain, inherited neuropathy, and faulty management. Among common causes of pain, most of them well known, he included aerophagy, which interfered with suction action, produced unrest and discomfort with a minimal food intake, and so led to the establishment of a vicious circle. "To prevent wind we must secure sleep, and to secure sleep we must prevent wind." He advocated the use of chloral hydrate in one-grain doses, given before feeds, in these cases of unrest. Two common causes of failure of lactation and consequent sleeplessness were nervous unrest and nasal obstruction. Dr. Cameron painted a vivid picture of the infant with a neuropathic inheritance, but went on to say that only a few babies suffered from this; a more frequent fault was bad management on the part of the nurse or mother. He stressed the exaggerated psychical stimulus which passed from the over-anxious mother, and referred to the sensible arrangement by which the Indian squaw carried her baby on her back and went on with her work. In older children sleeplessness was also very often a nervous reaction to the mother; refusal of food had the same origin. The child should never be urged to go to sleep, but should be encouraged by the natural assumption that it would succeed. Sleeplessness might be transitory, but if encouraged by maternal fears would be erected into a formidable habit. These observations did not exclude the necessity of inquiring into such practical points as warmth, adequate ventilation, excessive fatigue, and lack of exercise. Insomnia peculiar to children often evidenced itself by two particular symptoms—namely, night terrors and enuresis. The metabolism of children was less stable than that of later life; in the nervous child especially a slightly abnormal biochemical reaction might be provocative of the severest symptoms. In children the carbohydrate reserve was more easily exhausted. The blood sugar fell, and ketones accumulated in the blood. The speaker described the symptoms of a child with ketonaemia, including confused dreams and night terrors. Enuresis was a specific night terror, and generally affected the child who was particularly sensitive about such matters. He had often found that night terrors could be controlled by the administration of glucose. Dr. R. F. Rorke (Winnipeg) limited himself to the clinical manifestations of sleeplessness during infancy. Sleep in the young child was profound, so that it was undisturbed by the ordinary activities of a household. The child should not be too much shielded from noise, or it would soon come to demand these conditions for ordinary sleep. The dressing, bathing, and feeding of young infants produced enough fatigue to be a factor in deep sleep. The chief nursing difficulties were lack of an adequate sucking reflex and the impatient, awkward child; such difficulties could be overcome by good management. Dr. Rorke considered that constitutional tendencies played an important part in the disturbances of sleep. He described the restless neuropathic infant, and thought that this type of child generally lay on one side because of its tendency to head retraction; it was easily disturbed by noise, colic, or the contact of a soiled diaper, and required attention at frequent intervals during the night. It always reacted in a pronounced way to digestive disturbances, had frequent small stools with mucus, and passed much gas. This generally occurred during the first few weeks, and there was always a tendency to improvement as the child grew older. It was necessary to reassure the mother, since she often ascribed the symptoms to the poverty of her own milk. She should be advised to take open-air exercise, and to cut down the fat and protein of her food. When possible it was important to secure rest at night for the mother. In case of severe colic the infant should be given castor oil, and be kept on a diet of boiled water for eighteen hours. If it was suspected that the infant was getting too much food, water or lime-water could be given before each nursing. Dr. Rorke agreed that nasal obstruction was a common cause of failure in sucking and sleeping. He advised the use of paraffin, and in many cases the early removal of adenoids. He had not previously considered acidosis as a cause of sleeplessness. Among other more obvious causes of sleeplessness he mentioned otitis media, acute infections, pyelitis, eczema, and mental deficiency.

Dr. A. H. Spohn (Vancouver) said that sound sleep was an index of good health; pain and inherited neuropathy were the two important factors in sleeplessness. Children had a relatively longer gut than adults and a thinner abdominal wall, so that they were more prone to dyspepsia. He disagreed with Dr. Cameron's theory of ketonaemia, because he thought that night terrors were more marked after excessive carbohydrate ingestion. In Canada and the United States the carbohydrate intake was in great excess, and there was also a high percentage of disturbed sleepers. He considered the interference in carbohydrate metabolism referred to was rather a symptom than a cause. Dr. Spohn emphasized the inherited predisposition for disturbed sleep, and believed that it was becoming more common. He did not think that nocturnal enuresis was a manifestation of hysteria, since it occurred when the patient was beyond the reach of hysterical influences, nor did he associate nocturnal enuresis with sleeplessness; the former was common in institutional establishments, but the latter was rare. In summing up the practical points of management he emphasized the necessity for considering eugenics, the readjustment of modes of living, and the establishment of a more normal home life. He had used both atropine and luminal with some success, and thought that hydrotherapeutic treatment was occasionally indicated. Dr. Alan Brown (Toronto) suggested that thymus disease might be a cause of insomnia in some infants. Children manifesting sleeplessness with some difficulty in breathing were occasionally found by *x*-ray examination to have enlargement of the thymus. There might also be swelling of the nasal mucous membrane, which was supplied by a branch of the vagus. He had seen six such cases, in which exposure of the thymic region to *x* rays produced relief and ability to breathe and sleep comfortably. Dr. Swallow (Winnipeg) considered that one of the commonest causes of crying and restlessness in young infants was hunger. Dr. Rawson said that some cases of enuresis in childhood had been cured by distension of the bladder.

Artificial Sunlight.

Dr. Robert Hutchison announced that Dr. A. Eidinow had been prevented from coming to Canada to speak in person; Dr. Alan Brown (Toronto) had, however, consented to give the gist of Dr. Eidinow's paper, and then to proceed with his own remarks on the subject. Dr. Eidinow's paper referred in detail to the use of heat, infra-red, luminous ray, and ultra-violet ray therapy in the treatment of disease. Ultra-violet therapy might be employed for the normal skin, for the irradiation of diseased parts such as ulcers, and for the irradiation of foods and

drugs. The reaction of the skin depended on the intensity of radiation, character of wave-length, time of exposure, distance from the source of light, sensitivity of the skin, and area of skin exposed. He described the methods of utilizing the long rays and the short rays. He had himself designed a new lamp, the daylight lamp, with rays similar to natural sunlight. Patients could be exposed for many hours, and could sleep under it without danger of skin reactions. It consisted of a long mercury arc enclosed in a frosted vitreosil tube, and a series of tungsten filament lamps, easily controlled and foolproof. Experiments showed that animals exposed to this lamp developed a greater power to withstand intravenous injections of staphylococci. It should prove useful in convalescent states, but was contraindicated in all cases of acute pyrexial disease. Dr. Eidinow then described the various methods of short-ray therapy. He said that pigmentation should be avoided, since this immunized the skin to ultra-violet rays. The technique of short-ray therapy needed careful supervision, and was only safe in the hands of the specialist. In 85 per cent. of his cases the bactericidal power was increased on an average 7 per cent. Dr. ALAN BROWN said that Dr. Eidinow's work conformed closely with that done in Canada, but that they had not much experience of local actinotherapy because there was very little lupus among children in that country. Actinotherapy was not a form of treatment for all diseases, but it increased the resistance to disease. He alluded to the experiments of Dr. Robertson (Toronto), who had cultivated an organism of slight pathogenicity to rats, and had then produced in the rats by ultra-violet radiation a resistance to the organism 600 times greater than before. In Toronto head colds had been very prevalent, and all forms of therapy had been tried; it was now the speaker's habit to administer long-ray therapy in November and February, and the results had been very beneficial. Regarding the effect on digestion, it had been found that the hydrogen-ion concentration of faeces was increased in irradiated children, probably by the removal of buffer substances. Dr. Brown was convinced that sunshine was not used enough. The active rays of the sun only became effective in Toronto in the first week of March, and lasted till the first week of October. In winter the sun's rays were below an angle of 35 degrees with the axis of the earth, and were therefore useless. The latitudes in which rickets occurred were those between 40 and 60 degrees. It was important to remember the beneficial effect of "sky-shine"—the rays of the sun in the shade or through a film of cloud; these had as much as one-half to two-thirds of the value of direct sun rays. Dr. Brown recommended the use of foods with added vitamins in addition to the use of the direct ray. Professor H. B. CUSHING (Montreal) said that the Alexandra Hospital for contagious diseases was nearly empty during July and August; he supposed this was due to the decreased virulence of organisms during the sunshine months, and the increased resistance of the children. He hoped that eventually artificial sunlight would be provided in all schools, nurseries, etc. Dr. D. NABARRO (London) spoke of the exposure of milk to actinic rays in the process of cooling. Professor W. E. DIXON (Cambridge) disagreed with the former speakers, and said that human natural functions were not improved by adding excess of vitamin any more than by adding excess of any other food constituents. Most living animals avoided excess of sunlight, and it was evident that the sun could do much harm. He observed that with regard to the raising of an animal's resistance it had been shown that any substance injected into an animal raised its resistance. One should not ignore the effect of irritation after exposure to rays, or the psychical effect. Dr. MOORHEAD called attention to the fact that while advocating the use of vitamins most people preferred the bleached vegetables—namely, celery, lettuce hearts, and asparagus. Dr. ROBERT HUTCHISON, closing the discussion, said that they had not heard enough of the contraindications for artificial sunlight, and little or no allusion had been made to the negative results of the experiments carried out under the auspices of the Medical Research Council. He had noticed that in Canada they took precautions to exclude sunlight from their houses.

SECTION OF ANAESTHESIA.

Thursday, August 28th.

POST-OPERATIVE RESPIRATORY COMPLICATIONS.

AT the second meeting of this Section Professor W. WEBSTER, a Vice-President, occupied the chair. Dr. D. C. AIKENHEAD (Winnipeg) read a paper summarizing and commenting upon the post-operative respiratory complications in a series of 33,000 cases. The paper is printed at page 515 of this issue of the *Journal*.

The President, Dr. R. E. APPERLY (London), congratulated Dr. Aikenhead upon the magnitude of his figures. Referring to his own experience, Dr. Apperly stated that in twenty-two years he had administered over 37,000 anaesthetics to all types of patients. He considered that the preliminary use of atropine had been largely responsible for the abolition of post-operative pneumonia, which nowadays was not so common as previously. The routine practice in England was to give upwards of 1/100 grain of atropine, according to the age of the patient; this reduced the incidence of post-operative complications. He had found that nose and throat operations were singularly free from respiratory complications, and he held the view that the inhalation of septic material was not the sole cause of such difficulties. In pelvic cases he had observed almost as great freedom from post-operative respiratory complications; those which did occur usually followed radical hysterectomy. These complications were noticed most frequently after operations upon the upper abdomen; in such cases respiratory movement was restricted, which might be a factor. He had found splanchnic anaesthesia valuable in these cases. Dr. Apperly added that there was no known routine method by which respiratory complications could be prevented; each case must be considered individually. Dr. LA FLECHE (Winnipeg) thought that lung complications should be styled "post-operative" rather than "post-anaesthetic"; he considered the condition due to many factors, and especially to the pre-operative condition of the patient, preliminary medication, the site and region of the operation, the type of anaesthesia, the reduction of vital capacity, and the degree of post-operative care. During an operation many of these circumstances tended to lower the patient's resistance. The most important factors in prophylaxis were the use of CO_2 and oxygen to prevent atelectasis, and frequent changes of the patient's position in bed. Dr. FEATHERSTONE (Birmingham) stated that some years ago he had analysed forty different possible causes of post-operative respiratory complications, and concluded that the most prominent factors in their production were shock and infection, especially in operations upon the upper abdomen. His impression was that post-operative pneumonia was not so frequent as it was ten years ago. Possibly this was due to deficient nutrition consequent upon lung conditions. Dr. LAMB (Glasgow) said that some years ago he went through a series of post-mortem reports, and found no case of pure pneumonia as a post-operative complication; this was invariably associated with a septic condition. He considered there was a great danger in operating upon patients with coryza, and he referred to the high incidence of abscess of the lung following tonsillectomy in America, as compared with its rarity in England. Dr. S. JOHNSTON (Toronto) recalled a case of tonsillectomy followed by lung abscess in which the same culture was obtained from both sites. In America tonsils were usually removed in the upright position, while recumbency was the rule in England. Dr. BOTSFORD (San Francisco) stressed the necessity of clearing up all throat infection before operating. She believed that the nasal administration of gas and oxygen had largely reduced respiratory complications after tonsillectomy. Professor W. WEBSTER (Winnipeg) recommended the leaning forward position for tonsillectomy. Anaesthesia should not be sufficiently deep to relax the soft palate, because in these circumstances blood and pus were inhaled. This frequently happened when tonsillectomy was performed under local anaesthesia. Dr. E. I. MCKESSON (Toledo, Ohio) considered that many factors predisposed to respiratory complications; the most important was the depth of anaesthesia. In tonsillectomy the patient should be kept lightly under; the airway should be free,

because any obstruction tended to cause congestion of the lungs. Dr. BLEZARD (Edmonton, Alberta) said he had a great regard for atropine, and gave 1/100 grain four-hourly after operation as a prophylactic. Dr. HAYES (Christchurch, New Zealand) stated that he had never seen a post-operative lung abscess in New Zealand. Dr. AIKENHEAD replied to the questions raised in the discussion.

SODIUM AMYTAL AS AN ANAESTHETIC.

Dr. L. G. ZERFAS (Indianapolis, Indiana) read a paper dealing with the pharmacology and clinical applications of this drug, a derivative of barbituric acid. Dr. J. S. LUNDY (Rochester, Minnesota) stated that he regarded 16 to 45 grains as an anaesthetic dose when given intravenously; larger doses were toxic. In some cases there had been post-operative excitement, and he considered this due to the formation of isomers, which had an entirely different action. Sodium amytal should be regarded as an hypnotic rather than an anaesthetic. The largest total dose he had seen administered was 9,000 grains, which had been given in individual doses, each of 3 grains, for several months to check the convulsions of a patient with an intracranial tumour. Sodium amytal was useful in the treatment of gastric and duodenal ulceration because it checked the secretion of the gastric juice. Like all barbiturates it must be given with caution. It was prone to cause oedema of the lungs, for which the best treatment was an oxygen tent and concentrated glucose solution intravenously. Sodium amytal should not be employed in comatose conditions. Dr. BOTSFORD (San Francisco) described the effect of sodium amytal upon children. She had employed this drug in a large number of cases, and had noticed that, so far as children were concerned, the fear of operation was abolished, with consequent diminution of the risk of causing subsequent mental complexes. She administered the drug in capsules by the oral route, and obtained sleep or unconsciousness in five to twenty minutes. She had seen no post-anaesthetic complications and had noticed no ratio between the lowering of blood pressure and the psychic effect. She concluded that sodium amytal could be administered to children with safety, that it was more effective than opium in abolishing fear, and that minimal doses should be given by the oral route. Dr. MOORE (Grand Forks, North Dakota) reported good effects in obstetrical work, particularly from its intramuscular administration. Labour and even low forceps delivery could be conducted without the use of any other anaesthetic. There was never any complaint of after-pains. In reply to Dr. FEATHERSTONE (Birmingham) he said that there was no untoward effect upon the child. Dr. BLEZARD (Edmonton) had employed the drug in obstetrics. He stated that it relaxed the cervix. Dr. F. B. PARSONS (Cambridge) thought sodium amytal should be regarded as a particular form of premedication rather than as an anaesthetic. With all non-volatile anaesthetics it was impossible to secure rapid absorption and excretion, and therefore the anaesthetist could never be sure of his position; for these reasons inhalation anaesthesia was the more satisfactory. He observed that there was considerable divergence in the recommended doses of sodium amytal; this was an important point when dealing with derivatives of barbitone.

Friday, August 29th.

AVERTIN ANAESTHESIA.

At the final meeting of this Section Dr. H. W. FEATHERSTONE (Birmingham), Vice-President, occupied the chair, and Dr. F. B. PARSONS (Cambridge) read a paper on avertin. He surveyed the field of non-volatile anaesthetics in general, and discussed their disadvantages when compared with volatile anaesthetics, especially in connexion with their absorption and excretion. He described the pharmacological and anaesthetic properties of the drug, stressing the importance of careful preparation of the solution. Avertin had a marked effect upon respiration; this function was depressed with ordinary doses, while the cardiovascular system was uninfluenced. In man both the duration and the depth of anaesthesia were subject to considerable variation, and in no circumstances should the anaesthetist endeavour to produce full anaesthesia by increasing the recommended dose. Anaesthesia could always be deepened by the subsequent administration of a volatile inhalation anaesthetic. After discussing the absorption and excretion of the drug and its use in special conditions (particularly for patients suffering from exophthalmic goitre), Dr. Parsons said that the death rate intrinsic to avertin, after making all allowances for the submission of bad risks to operation, was about 3 in 10,000. This figure was comparable to that for chloroform, and he concluded that avertin was not an anaesthetic for general use when there were others, much safer, at our disposal. Nevertheless, in his opinion the drug was the best of the solid anaesthetics available at the present time, and it was of particular service in certain conditions.

Dr. J. S. LUNDY (Rochester, Minn.) stated that although the death rate for avertin for the first 30,000 cases was 3 in 10,000, this figure might conceivably be reduced considerably in the future. He had ceased to administer avertin in aqueous solution, and now gave it in 6 per cent. gum acacia. Since adopting this practice he had seen no case of tender anus following administration. Dr. R. WATERS (Madison) stated that he had used avertin intravenously. In a very few minutes the patient was anaesthetized, but detoxication was rapid, and in approximately ten minutes the patient had regained consciousness. The CHAIRMAN said his impression was that avertin was of considerable value for induction, and for this purpose it was the most pleasant anaesthetic we possessed. In his opinion the ether test was too severe. He preferred to give small doses of avertin. During the recovery period the patient, although anaesthesia was light, had muscular relaxation, and it was necessary to watch the jaw. He had had rectal irritation even when the solution had been most carefully prepared. He asked if the solution of avertin in amylene hydrate deteriorated in the course of time. Dr. HAYES (New Zealand) asked what effect avertin had upon young children. Dr. S. JOHNSTON (Toronto) questioned its value in nose and throat operations on account of the delayed return of the cough reflex. He inquired if there was any appreciable fall in the blood pressure. Dr. BOTSFORD (San Francisco) felt that avertin was of less value than sodium amytal or other barbiturate preparations. Patients did not regain their normal mental outlook for some days. A disadvantage, so far as America was concerned, was that avertin could not be administered by a nurse. Dr. PARSONS, in replying, stated that avertin could be given to children provided the rules concerning dosage were observed. There was very little fall in blood pressure during anaesthesia. The solution in amylene hydrate was permanent.

PRE-ANAESTHETIC HYPNOTICS.

Dr. E. I. MCKESSON (Toledo, Ohio) read portions of a paper with the above title. On account of previous discussion on sodium amytal and avertin, he confined his remarks to pernocton. Dr. McKesson stated that pernocton was a complex synthetic barbiturate closely resembling sodium amytal. It differed from the latter drug, however, in that with hypnotic doses there was no fall in blood pressure. The hypnotic power of pernocton was approximately twice that of sodium amytal, while the recovery period was half as long, and was characterized by much less restlessness. The drug was administered intravenously; injection should be slow, otherwise the incidence of post-anaesthetic sickness was increased. Another distinct advantage was that only a small amount of solution had to be injected. This was approximately 4 or 5 c.cm., for the recommended dose was 1 c.cm. for every thirty pounds of body weight. In regard to pre-operative medication, he said that he gave morphine 1/4 grain, hyoscine 1/100 grain, and cactin 1/60 grain.

Professor W. WEBSTER (Winnipeg) remarked that nowadays a patient was given several drugs to produce anaesthesia. He questioned the advisability of giving morphine, then hyoscine, then pernocton or avertin, followed by nitrous oxide or ethylene and perhaps ether. Dr. R. HARGRAVE (Toronto) asked if pernocton had any especial value in obstetrics; and the chairman, Dr. H. W. FEATHERSTONE, inquired if the chemical composition of pernocton was similar to that of sodium amytal. In reply, Dr. MCKESSON

stated that we were using more and more drugs in order to obtain balanced anaesthesia, and that better results were obtained with the "blunderbuss" method. He had had insufficient use of the drug in obstetrical work to give a considered opinion of its value. Pernocton had a close chemical relationship with sodium amytal. The President, Dr. R. E. APPERLY, said that the Section would wish to thank the Canadian officers for the excellent arrangements which had been made for the meeting. He also thanked them very much indeed for their wonderful hospitality. Dr. H. W. FEATHERSTONE endorsed the President's remarks. He referred to the coming centenary meeting of the Association, at which members of the Canadian Medical Association would receive a hearty welcome.

SECTION OF RADIOLOGY.

Friday, August 29th.

RADIATION THERAPY.

THE second day's proceedings took the form of a discussion on different branches of radiation therapy, with Dr. A. E. BARCLAY, President of the Section, in the chair.

Professor GENDREAU (Montreal) outlined the recent progress made in the radiotherapy of cancer. He described a Coolidge tube which had been recently built to withstand 300 Kv. pulsating current at 3 Ma., and was now in daily use. High-tension generators capable of producing this current have been available for some time. He discussed how these highly penetrating x rays could be used with advantage. With a longer skin focal distance, higher filtration, and a larger field, it was possible to increase the dose at a depth. X rays could be used alone or in combination with radium; in those cases where extensive areas had to be homogeneously irradiated, and large quantities of radium were not available, it was of great advantage to combine x rays with radium. He stated that the rays of this new tube had a wave-length as short as the softer gamma rays of radio-active substances, and the intensity of radiation at any given moment was equal to that of 300 grams of radium.

Dr. DOUGLAS QUICK then surveyed the general position as regards the uses of radium in the treatment of cancer. He described the conditions in which radium could be employed with particular advantage, and laid stress on others in which it was only of value in certain phases of disease. There was no essential difference between the action of the salt and the emanation. The important thing was the particular method employed and the quantity of irradiation used. In certain circumstances he advocated the combination of operative surgery with radium and x rays. In describing the work which was being carried out in connexion with the more accurate estimation of dosage, he stated that the application of irradiation from a quantitative standpoint was largely dependent on the relative radio-sensitivity of a given tumour as determined histologically.

Professor JAMES EWING (New York), who followed, said that the new high-voltage x-ray machines described by Dr. Gendreau were a real triumph in physical research. There were some indications that the intermediate wave-lengths between x rays and radium might give therapeutic results not produced by any of the agents now available, but too much should not be expected. Moreover, the apparatus was very costly, and it was well, therefore, to look for other methods of intensifying the action of x rays, such as the use of toxic metals and bacterial poisons and elevation of temperature. Dr. Quick had emphasized the need for determining the dose necessary to destroy a given tumour, and then making sure that that dose was delivered. As a pathologist, said Dr. Ewing, he had been impressed with the importance of determining the nature of the tumours in the laboratory. It was essential to determine the degree of malignancy and the degree of radio-sensitivity of every variety of tumour that came under observation. It was not now possible to attain these results in every instance, yet progress was being made rapidly. In an apparently homogeneous group were found the widest variations in malignancy and radio-sensitivity, and unless these differences were known it was impossible to manage intelligently any form of treatment. Referring to the principles now adopted in determining the doses of radium and x rays, he said that there were some highly sensitive tumours which disappeared rapidly under radiation as a result mainly of direct killing of cancer cells. But there was a much larger group of relatively or extremely resistant tumours that could not be cured by killing cancer cells except by dangerous doses, and with this group the principle of growth restraint by moderate repeated doses was probably much safer and more effective. It was essential that the radiologist should determine not only what type of tumour he had to deal with, but on what principle he would proceed in treating it. Dr. SKINNER (Kansas City) laid stress on preventive treatment. He said that no situation had yet been conquered by cure. We must eliminate the cause. Radiation was like a smoke screen. Dr. MALCOLM DONALDSON (London) asked Dr. Quick whether he believed radon and radium had the same action provided the same amount of irradiation were given. In England great importance was paid to the time factor; perhaps we had become obsessed with the idea of a small dose for a long time. He asked Dr. Ewing whether he thought a neoplastic cell in a lymph gland was more resistant by virtue of its surroundings.

Professor GENDREAU, replying, said he had great hopes of rapid development of deep x-ray therapy. Dr. QUICK said that at the Memorial Hospital they were very much committed to prolonged irradiation. External radiation alone would not as a rule cure an adult form of carcinoma. He advocated a combination of treatments, both surface and interstitial. Dr. EWING, in reply, said he believed England was in a more favourable position as regards the fight against cancer than any other country. He thought that there were two forms of irradiation, direct and indirect action. In the slow-growing adult cancers the cells were not killed by direct action.

TREATMENT OF UTERINE HAEMORRHAGE.

Dr. MALCOLM DONALDSON emphasized the importance of radiotherapy in non-malignant conditions, especially those distressing attacks of irregular haemorrhage so often associated with the onset of the menopause. He stressed the importance of excluding malignant disease. Either x rays or radium might be used in the treatment of these cases. If it was decided to give an anaesthetic to explore the uterus, then radium was the method of choice. On the other hand, in cases of pure menorrhagia, where malignant disease could easily be excluded, it was justifiable to use x rays, as this avoided an anaesthetic and enabled the patient to continue her work without lying up. Dr. Donaldson discussed the question whether an artificial menopause produced more severe symptoms than a natural one. He had found that in patients of 40 there was no difference.

Dr. E. W. PROUD (Vancouver), who followed, said he considered radium was specific in the treatment of haemorrhagic diatheses in women. He drew attention to the fact that menorrhagia and metrorrhagia occurred at all ages. The young were most tractable and sensitive, the old were less so. Great care should be taken in the irradiation of patients below 20 years of age, as the ovarian function might become permanently impaired. For this reason x rays, because of its smaller dosage and greater margin of safety, was given at monthly intervals. In multiparae, however, radium was the method of choice. In his work he used a dose of 1,800–2,000 milligram hours, and found that this dose was necessary to avoid recurrences. He laid stress on the sequels—necrosis and endometritis—but pointed out that these could be controlled. In treating the hard fibrous uterus the minimum dose should be given and repeated if necessary in three months. After this treatment about half the cases bled profusely once, and about one-third had two or more periods before becoming free. Diagnostic curettage was performed as a routine. In certain circumstances he advocated surgery, and in others a combination of radium and x rays. Dr. SHEPLEY (Saskatoon) suggested that an anaesthetic was not necessary for

the introduction of radium into the uterus. He stated that he had found 300 milligram hours a sufficient dose to achieve the desired effect. He suggested that the cessation of menstruation was brought about by some hormonal reaction of the endometrium. Dr. MALCOLM DONALDSON stated, in reply, that as curettage was usually necessary he did not favour local anaesthesia. He was surprised to hear that Dr. Shepley was able to obtain complete amenorrhoea with a dosage of 300 milligram hours. He believed the action of the radium to be on the ovaries primarily.

RADIUM IN EPITHELIOMATA OF THE SKIN.

Dr. ROY WARD'S observations in opening this discussion are published in full in this issue at page 511.

Dr. HUGH MACKAY (Winnipeg), who followed, said he had had the pleasure of visiting the London Radium Institute and seeing Dr. Roy Ward's work. He congratulated him on his paper. He considered radium was the method of choice in the treatment of basal-celled growths. Cosmetically it gave good results, and it avoided the necessity of operation, and many elderly patients were thereby spared nervous shock. He discussed the advisability of giving prophylactic doses to the primary lesion and to the glands after operation in cases of squamous epitheliomata. Dr. PROUD mentioned that he had been treating cases of rodent ulcer with a combination of *x* rays and radium, and Dr. PIRIE spoke of his experiences in the treatment of rodent ulcer with *x* rays.

Dr. A. E. BARCLAY expressed the gratitude of the Section for the boundless hospitality it had received, and Drs. PIRIE and MACMILLAN thanked the President and other members of the Section who had so kindly visited Canada for the meeting.

SECTIONS OF PREVENTIVE MEDICINE AND TUBERCULOSIS.

Friday, August 29th.

PRIMITIVE RACES AND EPIDEMIOLOGY.

THE members of both Sections met together, with Dr. CHARLES PARFITT (Calydon Sanatorium, Ontario), Vice-President, in the chair, and considered during the first half of the session four papers upon the subject of primitive races and epidemiology.

Professor S. LYLE CUMMINS (Cardiff) opened with a paper on tuberculosis in African natives when brought into contact with civilization. His attention had first been drawn to the subject by his experiences with the Egyptian Army between 1899 and 1909. Writing in 1912 he drew the conclusions "that primitive tribes are highly susceptible to tuberculosis because, in the absence of the tubercle bacillus, they have never been obliged to protect themselves against the organism"; and "that civilized peoples are highly protected against tuberculosis because they have, in contact with the tubercle bacillus, elaborated protective substances against this organism." European war experience led him to lay increasing stress on the individual acquisition of resistance through contact with infection. Most of the acute tuberculosis on the Rand was due to the lighting up of old foci rather than to infection from without acquired for the first time in the course of mining work. It was the young recruit arriving with "larval" or "childhood" lesions still active in the glandular reservoirs that was in danger of acute generalization of infection, fatal within a few weeks, when exposed to the combination of unfavourable physiological conditions implied in the exchange of the native way of life for work in the mines and compounds of the Rand. The lesions found were such as could be produced only by generalization through the blood stream from a pre-existing lesion. The facts of tuberculosis in Africans could best be explained by postulating that the race had not as yet developed inherited "immunity potential" to the same extent as the white races. Professor Cummins showed lantern slides contrasting the environment and ways of life of the natives: (1) primitive in their natural surroundings; (2) semi-sophisticated from prolonged contact with the white races but living on their own lands, as in Portuguese East Africa; and (3) cooped up in the insanitary slums of modern industrial townships. Later he dealt with the measures of prevention available. The essential first steps consisted in affording to the natives, in their territories, conditions of life which ensured good nourishment and in the building up of a sound medical service

Dr. J. HARVEY PIRIE (Johannesburg) followed with some remarks on post-mortem findings in South African negroes. The labour population was 400,000; there were 1,200 deaths from tuberculosis per annum, and five or six times that number were repatriated for tuberculosis. In a study of 700 tuberculous individuals it was found that one-third had the disease complicated with silicosis. These were practically all long-service men in the thirties and forties. The two-thirds with uncomplicated tuberculosis were mostly short-service men in the early twenties. The disease was acute and rapidly generalizing; death was frequent within the first three months of service. Invasion was overwhelmingly by the respiratory route. There was a complete absence of bovine strains. The post-mortem findings were those of generalized miliary tuberculosis, mostly with caseous bronchial or other gland mass. At times the infection had tracked along the lymphatics from the thorax to the abdomen, or there was marked involvement of the serous sacs, including the myocardium. The liver and spleen frequently showed marked changes, the kidneys rarely, bones and joints very rarely. In the lungs a gelatinous pneumonia had been found, and in a few instances showed pulmonary tuberculosis.

Professor J. G. FITZGERALD (Toronto), in a paper on laboratory evidence as an aid in early recognition of tuberculosis in contacts, directed attention to two laboratory procedures which he believed to be of value in epidemiological investigations of pulmonary tuberculosis —the tuberculo-complement fixation and inhibitive tests. Caulfield and his collaborators in 1925, Norwich and others, and recently Ogden, had published the results of investigations. Unpublished works by Ogden indicated that in a number of instances positive serological findings well in advance of the appearance of clinical changes made definite diagnosis possible much earlier than otherwise would have been the case. Three to eight tests over a period of one to five years might be necessary. The procedures were extremely complicated, and could only be performed by skilled serologists. Professor Fitzgerald described some encouraging results obtained at Toronto. His paper gave references to the literature.

Dr. C. H. VROOMAN (Vancouver) presented a paper on the racial incidence of tuberculosis in British Columbia. The population of British Columbia, some 600,000, was predominantly white, but a group of about 70,000 consisted of Indians, Japanese, and Chinese in almost equal numbers. The vital statistics of the province for the last nine years showed that this group, comprising little over 10 per cent. of the population, was responsible for nearly 40 per cent. of the total deaths from tuberculosis. Among the white population 1 out of every 13 deaths was due to tuberculosis; among the Japanese 1 out of every 6; among the Chinese 1 out of every 5; among the Indians 1 out of every 3. These very striking discrepancies raised the question of racial susceptibility to the disease. The results of the physical examination of 1,248 individuals from selected groups of the 25,000 Indians of British Columbia, including fishermen, agriculturists, and hunters, were then described; 6 per cent. were found to be suffering from active tuberculosis, or 1 in 10 of the population, if suspects were included. The great majority of the attacks were of active fibro-caseous adult type, showing little tendency to fibrosis; children between the ages of 5 and 14 were commonly affected. Tuberculosis had not infected the Indians for more than three or four generations. As to the Japanese and Chinese, it was probable that they too would show an incidence of tuberculosis proportional to their death rates. Owing to their modes of life and lack of sanitary care the members of these three peoples were exposed, especially in childhood, to more massive doses of tubercle bacilli than the white population.

There was little time left for discussion of the papers. Dr. R. G. FERGUSON (Qu'Appelle, Sask.) said there was

little to be added to the known description of African conditions, but the report of the commission on silicosis was awaited with interest. Work among the Indians was proceeding steadily in the pre-school, school, and reservation groups under whole-time physicians. Dr. A. S. M MACGREGOR (Glasgow) spoke of the incidence of tuberculosis among the Irish population of Glasgow, as compared with that of the indigenous population of the city. Dr. D. A. STEWART (Ninette) said that the medical problems of primitive races had been neglected. Latterly the needs of the Indians, infected by the whites, were being realized. A beginning had been made at Ninette among mixed strains of Indians long in association with the whites—a population permeated with tuberculosis and living under very bad conditions. Raising of the standard of living and the practice of rational pursuits were required. Professor CUMMINS, in reply, said that he found himself increasingly sympathetic to the view that there existed differences in racial susceptibility. After some generations of intense endemicity no appreciable evidence of increased resistance was found in some races. He laid great stress on the influence of habits and modes of life to which peoples were accustomed. He preferred the term "inherited resistance"—varying potentials of resistance—to "inherited susceptibility." The study of the disease in children would, in his judgement, prove the key to these problems.

ANTITUBERCULOSIS SCHEMES.

The subject of antituberculosis schemes was introduced by Dr. A. S. M. MACGREGOR. He pointed out that the relation of such schemes to the public health presented two aspects: the progress and efficiency of current preventive measures, and the nature of the disease. The preventive measures in tuberculosis had had much effect on public health generally—for example, in determining its present aspect towards housing standards and environmental hygiene. Prompt diagnosis, early treatment, and efficient after-care factors, which controlled modern tuberculosis work, were the fundamentals of public health principles. The speaker believed that the dispensary did its best social, medical, and preventive services as an outpost of the public health department; the main principles on which it should work should be that it had all possible modern facilities for diagnosis, including efficient observation. He thought that the new Local Government Act would work to the interest and competence of the dispensary physician, bringing him again more into line with the progress of general medicine. The dispensary had no effect on the incidence of tubercle in young adults because, in his experience, the disease had been sporadic, rapid, and already far advanced when discovered. The other great difficulty was the discovery of cases among contacts. As far as institutions went he thought too much stress might have been laid on the pure sanatorium as an instrument in treatment of early cases. What was required more to-day for the general population was hospitalization; 50 per cent. of his cases resided in one- and two-apartment houses, so that domiciliary treatment was impossible, and the sanatorium-hospital was a necessity. His cases were hospital against sanatorium in the proportion of 4 to 1; half his cases were advanced when reported, and three-quarters of the patients had died in two years. He believed that the arguments in favour of colonies depended on considerations outside the region of public health. With regard to the nature of the disease he pointed out that the rate of influx of susceptibles and the number of slum areas in any city caused the incidence of tuberculosis to vary. Investigation showed that there was little decline in tubercle between the ages of 15 and 25; the decline had been above and below this age group. There had been a fall of 50 per cent. in ten years in the age group 35 to 45, showing that there was probably much more infection in middle age, while there remained the acute disease of the young adult. There was much non-pulmonary tuberculosis in Scotland, but a good deal was being done in an attempt to diminish incidence and eliminate bovine infection, and to introduce adequate means of treatment. There had been marked reductions in death rates as contrasted with the first decade of the century. He strongly advocated pasteurization, while he believed it had assisted materially in the decline of bovine tuberculosis in Scotland.

Dr. R. E. WODEHOUSE (Ottawa) described Canada's experience as regards tuberculosis programmes. He said that the field work in Canada was in the direct charge of provincial departments of health. The institutional care of tuberculosis was, for the most part, under the direction of other than Government departments, but nearly one-third of the estimated cost of maintenance was contributed by the provincial Governments. The best diagnostic work, in so far as civilians were concerned, was carried on by what were known as travelling chest diagnosticians; these were medical men who were usually ex-sanatorium staff, and who visited, on an average once in three months, different centres in order to examine cases referred by the district practitioners. Home visiting and school inspection nursing services were not uniform over Canada; where they existed they were maintained by voluntary committees in small centres, and by official authorities in larger ones. Canada was marking time on the question of after-care or village settlements, and was waiting to copy the most useful and economic practice evolved elsewhere. He believed that real results were being obtained by the efforts now put forth, and that the feature which had had the greatest influence up to the present was the provision of sanatorium beds. The best results had been obtained under the management of voluntary committees, owing to the predominance of indigent cases cared for. Where a sanatorium was administered by a voluntary committee the administration had to be economic, efficient, and humane, so that it might attract the tuberculous to seek treatment and the municipalities and public to contribute more towards construction and maintenance. He concluded by enumerating the efforts of the Canadian Tuberculosis Association, which were mainly to stimulate the routine examination of presumably well school children, to obtain greater action in regard to the care of North American Indians, to hasten the provision of stronger efforts in the Maritime Provinces, where the death rates had been highest, to emphasize the importance of full-time medical services in industry, and to devise some approved form of after-care of discharged sanatorium cases. Dr. McDOUGALL of Preston Hall, at the request of the chairman, outlined the scheme of that institution, and after a short discussion Dr. Macgregor summed up the proceedings.

SECTION OF OPHTHALMOLOGY.

Friday, August 29th.

OPERATIONS AND DEMONSTRATIONS.

THE third session of this Section was held at the Winnipeg General Hospital, and was of a clinical and practical nature. Operations were performed, and demonstrations by lantern and models were given by the President (Mr. BISHOP HARMAN) and Mr. A. J. BALLANTYNE. Mr. A. W. ORMOND (London) gave a detailed, illustrative account of Gonin's operation for detachment of the retina. He did not regard the operation as likely to be a success in every case of detachment, but he thought that up to the present time it was the best contribution that had been made to the methods of dealing with that most difficult and unsatisfactory condition. He had himself been able to record a few successes. He would certainly aim at improving his technique with a view to getting the results claimed by Gonin. Mr. Ormond also demonstrated some excellent drawings of the eye conditions associated with Mongolian idiocy, leprosy, and other diseases. Mr. VERNON CARGILL showed some stereoscopic slides and a series of photographs, coloured and uncoloured, of fundus conditions, which he said were very useful for case records. He mentioned that with a little practice the interpretation of the uncoloured photographs became a comparatively easy matter. The members were much interested in his instruments brought from Amritsar, with which he demonstrated the operation of "couching" the lens as practised by the Indians.

Definition of Blindness.

Sir JAMES BARRETT (Melbourne, Australia) asked for a definition of blindness which would be applicable for industrial purposes, and for admission to institutions for the blind; in the course of his duties he frequently had to give an opinion. The standards he used in Victoria were: total blindness = inability to count fingers at 2 metres; almost total blindness = vision less than 6/60; partial blindness = vision less than 6/36. He frequently found people endeavouring to secure entrance into blind institutions with far higher standards than these, and he was anxious to have the support of the British Medical Association in fixing a standard. Mr. BISHOP HARMAN replied that, although a standard similar to that of Sir James Barrett was what was used in Great Britain, it was difficult to fix a numerical standard to decide the question whether a person was blind for economic purposes, since the limitation of the field of vision was an important consideration. In Great Britain the opinion of the ophthalmic surgeon was generally accepted after a thorough review of the case. He proposed that Sir James Barrett's problem should be referred to the Council of the Association.

Defective Vision and the Pilot Service.

Sir JAMES BARRETT commented on the necessity for a complete ocular examination in the case of a man in the pilot service who had had any accident with his ship. As oculist to this service in Victoria he had in mind one very instructive case. A pilot had missed a buoy and run his ship on to a sandbank; the explanation given at the inquiry was that at the moment of reaching the buoy a flight of birds obscured his vision. This was accepted, but not long afterwards the same man was involved in a collision, and his sight was then found to be defective. Sir James Barrett considered it a most anomalous thing that after an accident these pilots should be medically examined in every other respect except in the matter of the condition of the eyes. It was decided to refer this question also to the Council of the Association.

Interesting cases were presented to the Section by Professor T. HERBERT BELL and Dr. F. D. MCKENTY of Winnipeg, but owing to the lateness of the hour they had to be examined later, Mr. BISHOP HARMAN, Mr. CARGILL, Dr. IVOR CAMPBELL, and Dr. WHITESIDE ROBERTSON then discussing them.

SECTION OF BACTERIOLOGY, PATHOLOGY, PHYSIOLOGY, AND BIOCHEMISTRY.

Friday, August 29th.

Histology of the Glioma Group.

AT the final session, with Professor M. J. STEWART, a Vice-President, in the chair, Professor WILLIAM BOYD (Manitoba) read a paper entitled "The glioma group studied by ordinary histological methods." Referring to Bailey and Cushing's classification, to Penfield's brilliant contributions, and to the methods of Cajal and his pupils of the Spanish school of neuro-pathology, which constituted the basis of all recent work, the speaker reported a series of 31 cases, of which 16 were classified as astrocytomata, 9 as spongioblastomata, 1 as astroblastoma, 3 as medulloblastomata, and 1 as ependymoma; one was unclassified. He emphasized the fact that a diagnosis could be made satisfactorily by ordinary histological methods, and that subdivision was of importance because of the different clinical behaviour of these tumours. Professor WILDER G. PENFIELD (McGill University) stated that from the point of view of the neurological surgeon the present classification of gliomas was of great assistance.

Glomic Tumour.

Dr. L. C. SIMARD (University of Montreal) contributed an account of glomic tumour of the forearm, illustrated by a series of beautiful slides prepared by Masson's technique. The speaker recalled that in 1914 Masson described the occurrence of small (benign) tumours under the nail, and termed the condition anterior angioneuromyoma, or glomic tumour. Clinically these tumours generally arose under the nail, which bulged, exhibiting a bluish growth. There was piercing and almost unbearable pain. The growths might occasionally arise in the skin and forearm. Dr. Simard reported a case of the forearm type in a man aged 45. He added that Masson had associated these pathological structures with certain apparatus of glomerular-like structure, normally present at such sites; he believed them to be the regulators of the peripheral circulation. Answering questions by Professors Stewart and Muir, Dr. Simard stated that a total of about twelve or fourteen cases had been reported, of which only five were elsewhere than on the finger.

Physiology and Pathology of the Endometrium.

Professor J. H. TEACHER (University of Glasgow) read a paper on the normal structure of the endometrium and decidua and the menstrual cycle. He said that there was only one method by which the ages of human corpora lutea and decidua could be determined—namely, from the history of properly dated young human ova. A corpus luteum only signified the ripening of an ovum; its relation to menstruation was problematical. The speaker preferred to ignore the classical description of the menstrual cycle and to accept the theory of Heaps originally formulated thirty years ago; in its present form it stated that (1) the menstrual cycle in the human subject normally proceeded all the year round, but ovulation and corpus luteum formation occurred only from time to time; (2) there was no regular date of ovulation, and the lunar rhythm of the cycle was not due to ovulation nor to any as yet known cause; (3) in the absence of fertilization it was probable that several ovulations occurred in succession, as in polyoestrous mammals like the mare or guinea-pig. Professor J. B. COLLIP (McGill University) emphasized the importance of considering as distinct entities the two types of hormonal activity, for proof of which he mentioned the work of Loeb, Doisy, Corner, Wiesner, and others. He referred to non-fertile oestrus at normal puberty as being the usual condition rather than a rarity in mammals; he based this conclusion on the work of Evans and Long, Mirskaia and Crew, and his own personal observations. He commented on the association of non-fertile cycles with the absence of corpora lutea in the rat, and the relationship of these observations to those on the occurrence of menstruation in absence of ovulation in monkeys (the Hartmans and Corner). In his opinion the whole subject of sex physiology was in the melting pot, and before final conclusions could be formulated the work of the biochemist, physiologist, and pathologist would have to be correlated and greatly extended.

Intra-epithelial Growth of Carcinoma.

Professor ROBERT MUIR (University of Glasgow) read a paper dealing chiefly with the growth and extension of cancer cells in the epidermis. Such an occurrence, he said, could be met with under three conditions. (1) The cancer cells might reach the normal epidermis by direct spread from an underlying growth, thereafter extending within the epidermis. (2) The cancer cells might reach the epidermis by continuous growth from the duct of a gland opening on the surface; the outstanding example of this was Paget's disease of the nipple occurring secondarily to intraduct carcinoma. (3) The cancer might start in the epidermis itself and spread within it, instead of infiltrating the subjacent tissue as was usually the case. In some apparent instances of this type, however, the point of origin might be in the skin appendages. In all three conditions the growth of the cancer cells in the epidermis apparently met with considerable difficulty, and was accordingly relatively slow. It was not uncommon to find the cells scattered in the rete malpighii, and sometimes spreading widely into the sebaceous or sweat glands. The speaker had never seen a clear example of a return from the epidermis to the connective tissue, although its possibility could not be excluded. It could at least be said that once the intra-epidermal extension of the growth had been established the cells tended to be restricted to the epidermis.

THE PLASMA PHOSPHATASE IN BONE DYSTROPHIES.

Professor H. D. KAY (University of Toronto) contributed an account of the phosphatase of the blood plasma in bone dystrophies. He had extended to bone pathology the role in bone formatfon which Robison first suggested in 1923 for the enzyme phosphatase. A reasonably accurate method has been evolved for the determination of the amount of this enzyme present in 1 c.cm. of plasma, and the method has been applied to the plasma of patients suffering from various types of disease. The enzyme actively present in a localized zone in the growing bone hydrolized the phosphoric esters in the circulating blood, bringing about deposition of insoluble lime phosphate salts in the ossifying zone. Whereas in patients with diseases in which the bone was not involved the amount of phosphatase was normal, or only above it, in patients suffering from bone diseases in which a large portion of the skeleton was involved the plasma content of this enzyme was greatly increased. Such an increase had been found in osteitis deformans; in generalized osteitis fibrosa; in osteomalacia; in infantile, adolescent, and renal rickets; and also in one very severe case of carcinomatosis of the spine and pelvis. It was not present in arthritis, osteomyelitis, and bone disease of a purely local nature, nor in fragilitas ossium. The rise in phosphatase in generalized bone disease was not necessarily associated with any changes in the serum calcium or inorganic phosphate. The amount of increase found was from ten to thirty times the normal average, far beyond the limit of error of the method and the normal extent of variation. Professor Kay considered that whereas up to the present in bone diseases there had been known only two useful variables in the blood constituents, a third, the plasma phosphatase, might now be considered as being definitely available to assist in the attack on the problems of bone pathology. Dr. D. R. MCCULLAGH (Cleveland Clinic), instancing the usefulness of the method, mentioned that a sample of blood from a case strongly suggestive of generalized osteitis fibrosa (a condition confirmed by subsequent removal of a parathyroid tumour) had been sent to Dr. Kay without comment or information; the latter had reported that the plasma indicated extensive bone pathology.

COAL MINER'S LUNG.

Professor S. LYLE CUMMINS (Cardiff) outlined the earlier work on anthracosis, including the evidence from experiments on animals by Haldane and others that coal dust and soot in the lungs were readily taken up by phagocytic cells and swiftly removed from the respiratory apparatus, and also the observations of Mavrogordato that if guinea-pigs were first exposed to silica dust and then to coal dust, the latter, instead of being easily removed, was held up in the lungs, which then presented the typical appearance of anthracosis. Professor Cummins wished to focus attention on the dust risks to which coal miners were exposed, and to modify the current view that this industry was one in which the danger of pneumoconiosis might be to a great extent ignored. Tattersall (1926) had described silicosis in South Wales coal miners working in "hard headings"; the speaker in 1927 had described the pathological and clinical findings in a "hard heading" worker, and had suggested that the accumulation of coal dust in the lungs was caused by an underlying silicosis which had led to interference with the lymphatic drainage of the lungs. That such an effect might follow a low degree of silicosis, insufficient in itself to produce serious interference with health, was suggested by the fact that in this case the lung ash contained only 12 per cent. of silica. There was urgent need of further pathological, histological, and chemical investigations. For the past two years the speaker, in conjunction with Dr. A. F. Sladden, had been devoting attention to this side of the question. Up to the present 38 lungs had been examined, Dr. Tideswell being responsible for the chemical analyses, a limited number from persons engaged in industries other than coal mining serving as controls. They showed no marked accumulation of coal dust, and the lung ash contained about 1 per cent. of silica. A second group showing definite anthracosis, although the patients had exhibited no lung disability, gave a lung ash silica content of 5 to 20 per cent., while in a third, from patients definitely exhibiting lung disease, the silica content ranged from 25 to 42 per cent.; this group had nearly all worked in "hard headings," and the lung tissue showed an almost universal blackening. Summarizing his results Professor Cummins concluded from his series that the greater the amount of silica the more marked was the fibrosis, and, in consequence, the more complete was the blockage of lymphatic channels and the more intense the accumulation of coal dust in the lungs. Anthracosis was silicosis complicated by coal dust accumulation. Unlike simple silicosis it might lead on to serious respiratory disability and death without the intervention of tuberculosis. Bronchitis, the characteristic terminal lung disease of old coal miners, appeared to bear the same relation to anthracosis as tuberculosis did to the silicosis of gold miners on the Rand.

SECTION OF TUBERCULOSIS.

Thursday, August 28th.

TUBERCULOSIS IN CHILDREN.

PROFESSOR S. LYLE CUMMINS, President of the Section, occupied the chair at the second session, when the subject of tuberculosis in children was opened by Dr. MAURICE MCPHEDRAN (Philadelphia). He began by stressing the different appearances in the lesions in childhood and adolescence. The interaction of seed and soil presented a complex problem as regards the type, age, sex, and resistance; the significance and correlation of each could be shown by comparison of the *x*-ray representation of the types of tubercle in children and adults with the normal picture. He insisted on the importance of using *x* rays, and pointed out how they might reveal the only evidence of activity. He illustrated his contentions with quoted cases of tuberculosis associated with normal pulse, temperature, blood count, and sedimentation rate. He showed how diagnosis could be similarly aided in the common non-tuberculous basal lesions. Dr. RAY M. PRICE (Toronto) dealt with the bacteriology of tuberculosis in children. From the standpoint of incidence, she said, the human was the most important of the various forms of childhood tuberculosis; the bovine type came next, and its morbidity was to a degree parallel with the amount of tuberculosis in the bovine species; the avian type was an occasional factor. Referring to research being carried on in Toronto, she mentioned 207 medical and surgical cases of tuberculosis in children under 14; these showed that of 65 cases of medical tuberculosis 63 were due to the human type of tubercle bacillus and 2 to the bovine type. Pulmonary tuberculosis was essentially due to infection of the human type. Of 75 cases of bone and joint tuberculosis there were 72 in which the infecting organism was human, while 3 were bovine. In 30 cases of tuberculous cervical adenitis 17 were human and 13 bovine, while of 20 cases of renal tuberculosis 18 were human and 2 bovine. Only 2 cases of primary abdominal tuberculosis were encountered, and both proved to be bovine. One case of generalized glandular tuberculosis was found to be of the avian type. The research workers had interested themselves in the study of raw market milk. Of 250 samples from small dairy farms supplying Toronto with milk for pasteurization only 3.7 per cent. proved to be infected, but in striking contrast 26 per cent. of pooled bulk milk prior to pasteurization proved to be infected. The work went to show that the effective pasteurization of milk eliminated the menace of bovine tuberculosis. Dr. D. NABARRO (London), who discussed mediastinal glands and primary lung tubercle in children, said that his observations of the last two years had proved that the primary lung focus arose from insufflation, and that it gave rise to secondary tracheo-bronchial glands. The primary focus was usually found immediately beneath the pleura, and on the right as against the left side in the proportion of 3 to 2. His research led him to believe that if a lung focus was present tuberculous mediastinal glands would be discovered; if glands were found to be infected a lung focus would be present. His work at Great Ormond Street had shown that in 424 post-mortem examinations on children

under the age of 12, 15.8 per cent. had shown tuberculous disease; in only one case had he found lung signs with no corresponding change in the mediastinal glands.

Dr. W. J. DOBBIE (Weston, Ontario) emphasized the need for more adequate measures for the prevention of tuberculosis in childhood. He believed that the infection rate was a point of paramount importance. Since the sources of infection were well known, and the conditions of development recognized, the hope for the future lay in the active and persistent application of the knowledge already available. While he welcomed research, it would be better to apply what was already known. He stressed the application of the following measures: (1) adequate means of protection; (2) the removal of all children under the age of 16 from active open cases; (3) the adequate prevention of expectoration in public places; (4) proper medical inspection of children, with immediate segregation on the discovery of a lesion; (5) the removal from schools of all open cases among pupils or staff; and (6) appropriate treatment being carried on for some years. It might, he added, be claimed that such a scheme would produce a generation without resistance from lack of immunity, but he believed that such fears were groundless. Dr. PARSONS commented on the importance of pasteurization in the fight against tuberculosis in children. He pointed out that the obtaining of pure herds, free from tuberculosis, would be the ideal, but would take generations to accomplish. The best form of control was pasteurization. The evidence of its efficiency was the presence of tubercle bacilli in raw milk and their absence after pasteurization. The practical result of its application on the incidence of tuberculosis and its mortality could be determined from a study of non-pulmonary disease in the age groups of 1 to 4, or even of 1 to 14. Bovine infection had a preference for the lymph nodes in early life. It was evident from their work in Toronto that the pasteurization of milk was showing tangible results. They now saw very little glandular tuberculosis, while peritoneal tuberculosis was a rarity. From 1911 to 1915 hospital records indicated 0.025 per cent. non-pulmonary tuberculosis; the figure for 1924 to 1928 inclusive was 0.013, a reduction of 50 per cent. He concluded by pointing out that pasteurization did not harm the milk. Dr. J. A. JARRY (Montreal) dealt with childhood tuberculosis and housing. He submitted figures connected with a survey of 1,256 cases of tuberculosis at the Bruchesi Institute. Complete investigation of the cleanliness and peopling of the houses was made, and his conclusions were that in Montreal the problem of the slum did not exist, while the dwelling by itself was clean. He had found that the situation was aggravated by the overcrowding of homes and the overpeopling and lack of aeration in the central wards of the city. He had concluded that family contamination and underweight in children were the dominating problems, and he believed that the solution for the future was dependent on the education of the people and the protection of childhood. He stressed the importance of giving all possible help to students and physicians who wished to investigate tuberculosis. In the end, the problem lay in early diagnosis, and this fact presupposed in every physician the required competence to discover the disease on its first symptoms. Dr. BRUCE CHOWN (Winnipeg) discussed tuberculosis in childhood with special reference to the pulmonary form. No one could be dogmatic about the etiology of tuberculosis in childhood, since what applied to one community did not necessarily apply to all others. In Winnipeg he had come to look on the problem as one almost entirely of human infection, since the bovine tubercle bacillus as a causative agent was so rare as to be a curiosity, while the human bacillus was so often encountered as to be appalling. It was a common mistake to believe that tuberculosis early affected the child's nutrition. Cough was more often present than mentioned, and pleurisy with effusion was often the first definite symptom. In diagnosis he stressed the value of getting a history of contact, a positive tuberculin reaction, and an *x*-ray film. The tuberculin test ought always to be correlated with the type of community in which it was practised; he believed that a positive test was not only of diagnostic value for one particular child, but pointed the way back along which the bacillus had come. He would warn against the all-too-frequent and unjustified diagnosis of hilar increase and enlarged hilar glands. In treatment he was constantly surprised to find how well an infant could handle a quite extensive infection if kept isolated from adult re-infection. No child with a positive tuberculin reaction should be declared free from pulmonary tuberculosis without a good *x*-ray film properly interpreted. A very full and interesting discussion followed.

SECTION OF LARYNGOLOGY AND OTOLOGY.

Friday, August 29th.

NASAL SINUS SUPPURATION PERSISTING AFTER OPERATION.

DR. PERRY GOLDSMITH (Toronto) opened the second day's discussion, with Dr. S. W. PROWSE, Vice-President, in the chair. He said that he was not alone in his view that there had been a great deal of unnecessary and unwise surgical zeal devoted to the nasal accessory sinuses. Persistence of discharge from any nasal accessory sinus following operation did not necessarily demand further surgical measures of a more radical nature. The main symptoms which troubled the patient, such as pain or discomfort in the head, nasal or post-nasal discharge, nasal obstruction, recurring head colds, and mental depression, might have been so greatly benefited that even if some nasal or sinus secretion persisted it was not usually of sufficient importance to require further surgical intervention. The type of patient was of importance in determining the treatment; the neurotic patient might simply require to be encouraged not to worry about a little nasal discharge. Dr. Perry Goldsmith reviewed some of the reasons for failure in the operative treatment of the different nasal sinuses. He felt that the use of ionization with zinc in large irregular sinuses was likely to be a useful and hopeful adjunct, though he had had little clinical experience of it. A not uncommon cause of persistent discharge from an antrum that had been operated on by this method was failure to recognize frontal and ethmoidal disease. He preferred the canine fossa route in operating on the maxillary antrum, because it gave much better access than the intranasal route. In all cases it was better to remove the anterior third of the inferior turbinal. Assuming an antrum to have been thoroughly cleared of all pyogenic oedematous mucosa, and an efficient opening made into the nose, it might be some months before all noticeable secretion ceased. The patient might have poor recuperative powers owing to ill-health produced by anaemia, tuberculosis, syphilis, chronic nephritis, or any debilitating disease. His manner of living, habits, diet, and even the atmosphere in which he worked, might have a bearing. The heavy, rapid, immoderate eater and drinker, with chronic intestinal sepsis and constipation, did not clear up well after sinus operations. Lack of exercise and confinement indoors had a definite influence. Many patients with oedematous manifestations of their sinus mucosa had as an underlying factor an allergic state. The persistence of suppuration following operations of the ethmoid was in most cases due to free and spontaneous drainage not having been provided. Mr. A. J. WRIGHT (Bristol) said that one factor of the utmost importance in the treatment of nasal sinus suppuration was that of time; many so-called incurable cases cleared up eventually. Dr. A. LOGAN TURNER (Edinburgh), with the aid of a series of excellent lantern slides, insisted on the importance of the part played by the ethmoidal cell labyrinth in maintaining the nasal discharge. This was a factor which must not be overlooked in the consideration of the subject; by some it was regarded as the key position. He showed slides illustrating the development of the various groups of "border cells"; the more extensively these were developed the more difficult became the problem of successful drainage of the ethmoid cells. There were many cases in which no intranasal operation, however radical, could reach every infected ethmoidal cell, and the question of the advisability of an external operation might be usefully discussed.

Dr. M. F. ARBUCKLE (St. Louis, U.S.A.) said that allergy was a condition that had been mentioned with regard to post-operative nasal sinus suppuration; he thought it deserved more attention from the rhinologist. Many persons afflicted with headache, asthma, chronic bronchitis, hay fever, nasal obstruction, abnormal nasal discharge, and the like consulted the rhinologist or the internist, and in many cases they had had one or more nasal operations without relief. A very considerable percentage of such cases represented persons who were suffering from a so-called allergic reaction, and the most important step in their treatment was the discovery and removal of the offending substance or substances, which often brought about most unexpected and striking results. Professor G. W. FLETCHER (Winnipeg) said that, although the borderline between chronic non-suppurative and chronic suppurative sinus disease was not strictly marked, and one often merged into the other, the main picture stood out clearly. Chronic non-suppurative inflammation was much commoner than was generally supposed, and was often described by the patient as a "chronic nasal catarrh." There was no purulent discharge present, except in periods of acute infection. Mr. Tilley had claimed that these cases were often overlooked by the physician, since transillumination revealed no opacity. A radiograph, however, showed an opacity caused by degenerate or thickened membrane. The symptoms in these cases were not marked. They consisted of excessive mucoid discharge from the affected cavity, and mild attacks of neuralgia in the first and second divisions of the fifth nerve. Diagnosis was made by *x*-ray examination and puncture, which might yield a mass of thick, glairy mucus. Pathologically this was essentially a low-grade inflammation resulting in oedema and thickening of the mucous membrane. The cellular elements were very scanty. The cilia might be present at certain parts and scanty in others, and polypoid changes might be present. Hyperplasia of the glands occurred, and the formation of cystic dilatations in the sinus. Chronic suppuration of the maxillary sinus was characterized by purulent nasal and post-nasal discharge from the affected cavity or cavities. Other symptoms that might be present consisted of supraorbital pain, headache at times, tendency to contract colds, nasal obstruction, cough, and chronic chest sequelae. This was the ordinary form of antral disease, being much more common than the form previously described. The process was also much more active and the symptoms more pronounced. The pathology differed from the catarrhal form, inasmuch as infiltration with cells was much more marked. The membrane was, as a rule, much thickened. This might be uniform or patchy in distribution. Patches of granulation occurred sometimes, and areas of completely desquamated epithelium. Polypi might be found springing from any part of the walls. Caries and necrosis of the bone did not occur except in cases of syphilis and tuberculosis. In long-standing cases fibrosis developed, especially in the deeper layers. The excellent work done by Knowlton and McGregor was worthy of note. The antral linings in dogs were removed completely; in three cases it was found that regeneration of the mucous membrane commenced in the period of one to two weeks, at the end of three months it was largely completed, and at the end of six months it was practically impossible to tell the difference from normal antral lining, the cilia had been so completely restored.

Mr. F. F. MUECKE (London) said that the more he operated on the nose the more conservative he became. He thought that the turbinates should not be removed; he looked on them as among the most important tissues in the body. Simply on stopping irrigation a nasal discharge frequently cleared up. He had abandoned the intranasal method of operating on the antrum, since one could not see round the corner, and he preferred to leave the sphenoidal sinus untouched. He believed strongly in correcting any gross septal deviation to aid nasal drainage. Dr. MCGREGOR (Toronto) described experimental work on the nasal sinuses. He had also been interested in the eosinophils for some time with respect to asthmatic conditions. Such patients varied surprisingly from time to time, and the eosinophils disappeared almost completely in the presence of almost any infection. Sir STCLAIR THOMSON (President) said that the slides shown by Dr. Logan Turner indicated why nasal suppuration was sometimes inevitable in spite of any operation. They showed, too, that one should be tender of the reputation of one's colleagues who had operated on such cases. In opposition to Mr. Muecke, he considered the sphenoidal sinus the most satisfactory one for operative treatment. The ethmoidal labyrinth might be termed the *bête noire* of the rhinologist. Vaccines, in his hands, had proved absolutely useless.

A SAFE METHOD OF DEALING WITH ETHMOIDITIS.

Mr. E. A. PETERS (London) read a paper in which he urged that in all cases of ethmoiditis radiograms should be taken to obtain information as to the infection of the sinuses. Radiographic pictures of the frontal sinus were usually definite, of the maxillary sinuses less definite, and of the sphenoidal sinus very indefinite. He considered that primary ethmoiditis operations should, except for simple polypus, consist in removal of the middle turbinal and intranasal drainage of the sphenoidal sinus and maxillary antra. Excision of the middle turbinal should be carried out by Luc's forceps, either in its entirety by gripping the body of the bone, or by nibbling from the anterior end and removing the opened cell. Ethmoidal cells should be opened later under local anaesthesia only if symptoms of closed empyemata appeared; extensive opening of these cells was rarely indicated.

DEAFNESS IN SCHOOL CHILDREN.

Dr. HORACE NEWHART (Minneapolis) read a paper, illustrated by lantern slides, on recent efforts to prevent deafness among school children. He gave details of the work he had been carrying out in Minneapolis, showing the successful results brought about by the thorough organization of the diagnosis of deafness and its preventive treatment in the schools of that city. Dr. AUSTIN A. HAYDEN (Chicago) looked upon Dr. Newhart as a revolutionary in otology. He insisted on the value of the 2 A audiometer, which in his opinion standardized the testing of the hearing. Dr. Hayden also showed an interesting cinematograph film dealing with the work of the League of the Hard of Hearing.

TREATMENT OF OTOSCLEROSIS.

Mr. SCOTT STEVENSON (London) read a paper on otosclerosis, with special reference to treatment. He said that it appeared to be almost anathema among otologists to mention treatment with respect to otosclerosis, yet the subject continued to interest and perplex them on both sides of the Atlantic. He went on to review recent methods of treating otosclerosis which had been reported, including the administration of parathyroid extract by E. Watson-Williams and the operative treatment suggested by M. Sourdille; so far he had found nothing to displace the electrophonoide method of Zund-Burguet, which he had employed with a certain degree of success for some years, in spite of the criticisms the method had received at the hands of many otologists.

UNDER the auspices of the National Association for the Prevention of Infant Mortality and for the Welfare of Infancy a course of post-graduate lectures on maternity and child welfare will be given from October 13th to December 15th on Mondays, from 6.30 to 7.30 p.m., in the lecture hall, Carnegie House, 117, Piccadilly, W.1. This course is intended to prepare candidates for the post-graduate certificate of the association. Tickets, which cost 7s. 6d., are obtainable from the secretary at the above address. Another course, consisting of elementary lectures on infant care, in preparation for the crèche nurses' elementary certificate, will be held at Carnegie House, from October 9th to December 11th, on Thursdays, from 7.30 to 8.30 p.m. Matrons of crèches, not fewer than two of whose probationers or other workers are attending the course, are invited to accompany their students free of charge. The cost of tickets for the whole course of ten lectures is 10s., and must be applied for in advance to the secretary, National Society of Day Nurseries, 117, Piccadilly, W.1.

British Medical Journal.

SATURDAY, SEPTEMBER 27TH, 1930.

THE FILTERABLE VIRUSES AND PRACTICAL MEDICINE.

THE gradual lifting of the curtain on the filterable viruses is one of the most fascinating movements of our time, and accordingly the discussion on these specific pathogenic agents in relation to practical medicine, which was introduced by Lord Dawson of Penn in the Section of Medicine at the Winnipeg Annual Meeting last month, is in good season. Moreover, as the present year has witnessed the demonstration by a group of clinical and laboratory workers at the London Hospital that psittacosis is due to a virus of this nature, and this observation has since been abundantly confirmed by others, the choice of Dr. S. P. Bedson to open the discussion was singularly appropriate. His paper, which is printed this week at page 505, comprises a review of the present state of knowledge of these disease agents and its application to clinical medicine. It is an admirable survey of the progress that has been achieved, while at the same time no secret is made of the difficulties—some of them formidable—that remain to be surmounted. The problem of the nature of these viruses is indeed most perplexing, and of far more than academic importance. During the past thirty years the list of diseases, both of plants and of animals, which are due to agents of this class, has grown so large as to make it imperative to understand the nature of the agents, and so be in a position to deal with their ravages in a scientific and more successful manner.

The view taken by Dr. Bedson that the filterable viruses are nothing more nor less than minute living micro-organisms, akin to bacteria, is one that is shared by a considerable number of those who have studied them closely in the light of an extensive experience of the more easily handled pathogenic bacteria. "With each step forward in our knowledge of these viruses, the line of demarcation between them and the bacteria becomes less and less obvious, and I look forward with some degree of confidence to the time when the filterable viruses and bacteria will be merged into one large group, inside which, of course, there will be slight differences—subgrouping—just as there is in the case of bacteria at the present time." It is difficult to see how, on the evidence to which he refers, any other view is feasible. Moreover, much of the progress that has been made during recent years in the elucidation of these viruses is directly due to the application of knowledge previously gained in the practical study of bacteria, and it is possible, and even probable, that additional advances will be made before long by further application of the same principle. Was it not William Harvey who wrote: "There is but one road to science—that, to wit, in which we proceed from matters more known to matters less known, from matters more manifest to matters more obscure"? Speaking generally, the trend of recent developments in the study of filterable viruses is to bring these infections more and more into line with those produced by the ordinary pathogenic bacteria.

The chief interest of practical medicine in these viruses lies, however, in the applications that can be made of new knowledge gained in the experimental laboratory to the prevention, diagnosis, and treatment of the specific diseases produced by them. Dr. Bedson's paper contains an account of what has been accomplished in these several directions. The employment of living virus for purposes of prophylaxis, even when the virulence is reduced by suitable measures, is obviously an early stage in the practical prophylaxis to the filterable viruses, and in view of recent experience with vaccinia improvement in this direction is especially desirable. Exploitation for purposes of diagnosis of the specific antibodies that are certainly formed against some of the filterable viruses, and probably against all, has hardly begun; but the successes already accomplished and described by Dr. Bedson in the course of his survey indicate that further advances may be expected in this direction before long. Finally, it would seem that the method of passive immunity has already been applied to the prophylaxis of poliomyelitis and measles with encouraging results. There is ground, therefore, for hoping that further study of the serum of hyper-immunized animals in the experimental laboratory may lead in due course to the introduction of a successful form of treatment for virus diseases by specific serum, the lack of which is at present only too obvious.

THE TRAFFIC IN DANGEROUS DRUGS.

THE Assembly of the League of Nations at its meeting last year somewhat tardily arrived at the conclusion that the magnitude of the illicit traffic in dangerous drugs, disclosed by the reports of its Advisory Committee, could only be dealt with effectively by the strict limitation of the production of such drugs to the amounts required for medical and scientific purposes. The resolution passed unanimously by the Assembly on September 21st, 1929, stated that "impressed with the disclosures as to the large quantities of dangerous drugs still passing into illicit traffic . . . and desiring that, if possible, steps supplementing the Convention should be taken without delay to limit the manufacture of dangerous drugs to the amounts required for medical and scientific purposes . . . the Assembly requests the Advisory Committee to prepare plans for such limitation, regard being had to world requirements for medical and scientific purposes. . . . The Committee's report will be submitted to the Council, which will decide on the convening of a conference of the Governments in whose countries the above-mentioned drugs are manufactured and the principal consuming countries in a number not exceeding that of the manufacturing countries." It was thought that it would be necessary to hold a preliminary conference of the drug-manufacturing countries before the summoning of the larger conference, which would include representatives of both consuming and manufacturing countries; but on July 9th of this year the British Government informed the Secretary-General of the League that the requisite material for the earlier conference was not yet available, and that this conference, contemplated for the end of July, could not be convened. At a meeting of the Council of the League on September 18th it was announced that the larger conference on limitation of manufacture would be held on May 27th, 1931, and that the preliminary conference of manufacturing countries would assemble in London on October 27th of this year.

It is clear that any scheme for the limitation of production must have regard to some standard for the legitimate requirements of the world for medical purposes. It will be remembered that some years ago a mixed commission of the Health and Opium Committees of the League reported that the medical use

should be considered the only legitimate use of the drugs, and that the use of opium as a stimulant, as in some tropical countries, was not regarded as legitimate. It was later reported by the Health Committee that 450 mg. of raw opium might be regarded as the medical requirement per head per annum. As the result of a more recent investigation by the Health Section of the League on "world consumption of opiates and cocaine," a figure of 140 mg. of raw opium per head per annum was arrived at, which covers the medical requirements of medicinal opium, morphine, heroin, and codeine, or less than one-third of the earlier figure which had been propounded. Taking the estimated population of the world at 1,950 millions, this would give the world requirement of raw opium for medical purposes as 273 tons. Dr. Wasserberg, commenting on these statistical results, regards this as an overestimate, and considers that "250 tons of raw opium and 6 tons of cocaine are sufficient for the world's requirements." It is true that the data from which these statistics have been compiled were incomplete, and the figures in many cases were merely estimates, but they appear to represent the best available basis on which to formulate—it may be provisionally—the world requirements. When these results were considered by the Advisory Committee the representative of India intimated that "he had always been against the fixation of a standard," and "he thought it preferable to abandon any attempt to fix a figure for the world consumption." M. Brenier, who for nine years was the able assessor to the Committee, drew attention to the wide diversities in the consumption of medicinal opium and morphine respectively in the United States, Great Britain, Switzerland, and Germany.

Unless and until some more reliable standard of world requirements is forthcoming it will be well, in view of the appalling extent of the illicit traffic in the drugs in question, of which there are almost daily disclosures, to agree on some maxima of production in the manufacturing countries. No one would wish that the supply for legitimate usage should anywhere be insufficient. But it is now eighteen years since the Powers chiefly concerned undertook by The Hague Convention to co-operate among themselves to prevent the use of these drugs for other than medical and legitimate purposes, and five years since this obligation was reiterated and endorsed by a yet larger number of Powers in the Geneva Convention.

THE ETIOLOGY OF SUMMER DIARRHOEA.

ALTHOUGH an alarming increase in gastro-enteritis cases among infants is no longer a common event of the summer months, these maladies are still a persistent cause of infant mortality and morbidity, and investigations made to discover their origin have much practical importance. Theories put forward at one time or another, which attribute the so-called acute intestinal intoxication to dietetic faults, to this or that organism, or to parenteral infections (of which, according to W. McKim Marriott, otitis media plays the principal part), have not met with general acceptance. Now we have the record of a valuable investigation recently carried out at Toronto by M. M. Johnston, Alan Brown, and F. F. Tisdall,[1] who made a precise study of 171 cases of intestinal intoxication during the period October, 1928, to October, 1929. Some of the cases in this series occurred in the winter months, but with the onset of the warmer weather their numbers increased, reaching a peak some time after the hottest season of the year. Most of the patients belonged to the "out-patient" class, a sufficiently well-defined social group, and of these 97 were males and 74 were females. Only 5 were breast-fed; 5 had an unknown dietary history, 20 were receiving a mixed diet, and 141 were bottle-fed. On their admission to hospital all these infants were examined for signs of ear involvement, and these were found in 45. Of the 126 whose ears seemed normal, 65 developed otitis media later, making a total of 109, or 63.7 per cent. of the whole series. Attempts were made to cultivate the organisms present in the ear, nasopharynx, and throat, but while streptococci were isolated in a large proportion of cases, particularly from the nasopharynx and throat, these organisms did not appear in pure culture. Their failure to isolate one species of bacteria from the series, or a uniform flora, tells, in the authors' opinion, against the theory that masked mastoiditis is at the root of the intestinal intoxication. They carried their investigation a stage further by studying a control series of 84 infants of the same age and social group, of whom 53, or 61 per cent., had otitis media on admission to hospital or developed it during their stay. There was no significant difference between cultures of the organism from these patients and those from the intestinal intoxication group. These findings, together with the fact that 126 out of the total of 171 infants had no otitis media after the intestinal symptoms had become established, seemed to the authors adequate grounds for discarding the theory that ear disease is an etiological factor in intestinal intoxication. They then turn to the results of bacteriological examinations of the stools, and these are suggestive, for from no fewer than 129 of the cases they isolated a large variety of strains of Gram-negative bacilli. In the control group, on the other hand, the organism isolated could be considered important in only two of the cases. Agglutination tests were carried out with all available serums, and the demonstration of the presence of immune bodies in some of the serums seems to have established a connexion between the organisms found and the condition of the patients. The final conclusion reached in this study is that intestinal intoxication in infants is an external infection caused not by one specific bacterial species, but by a variety of bacilli belonging to the colon-typhoid-dysentery group.

[1] *Canadian Med. Assoc. Journ.*, August, 1930.

INTERNATIONAL CO-OPERATION IN HEALTH.

THE British delegation (writes our Geneva correspondent), although it lacks this year the presence of the Prime Minister, is a very capable and effective one, and British contributions to the debates in the Assembly and its committees are full of initiative. Nothing could have been better than the presentation of the account of the health activities of the League by Miss Susan Lawrence, Parliamentary Secretary to the Ministry of Health. Miss Lawrence recalled with pride the fact that more than one international conference on the health work of the League had been held at the offices of the Ministry of Health in London. To quote her words: "In considering the work which is being done to improve conditions of health in my own country and the contributions we are making to health work in the British Empire by our School of Hygiene and Tropical Medicine, and by our most recent School of Post-Graduate Medical Education, the reflection presents itself to my mind . . . how essentially similar, in spite of wide differences of local circumstances, are the problems which confront us all." The same difficulties, she added, repeated themselves in every crowded urban area, and in every scattered rural population; the experience of each country was immensely valuable to all the others. The Health Organization had achieved results which proved how successful international co-operation in health matters might become. "International co-operation in health is relatively easy; there are few, if any, vested interests comparable to those which are

a bar to progress in the economic field; while in that even more difficult field of international co-operation, the political, success is to be gained only by greater determination and more strenuous efforts to overcome more serious obstacles." The ten years' work of the Health Organization, Miss Lawrence said, had been marked roughly by three stages: first, the study and collection of information; secondly, the formation of general judgements on the basis of the material collected; and, thirdly, the stage of action. As an example of the kind of inquiry which it was open to any country to ask the Health Committee to take up, she instanced the supply and distribution of radium. Recently Great Britain found itself among the countries in which the public, as well as the Government, desired to extend the beneficial effect of radium in the treatment of cancer, and a large sum of money was acquired for the purchase of radium for hospitals. But the question arose at once as to the best and most economical means of its application. When this matter was placed before the Health Committee it was found that many other countries desired the same international study which had now been started, and already had produced most useful results. Miss Lawrence paid a tribute to the medical director of the Health Organization, Dr. Rajchman, and his staff, and to the Health Committee of the League, a small body, several of whose members had served from the foundation of the organization, and had spared themselves no trouble to give to the League the technical guidance which it needed. "And we must never forget that it is the co-operation of the different health administrations, and the many experts who have given their services in different lands, that make it possible for us to record satisfactory progress from year to year." She considered that the inquiries with regard to infant mortality, which had been made in selected districts in seven countries, might well be extended. Attention might be drawn to the high rate of mortality during the first days of life, together with the stillbirth rate, which apparently remained constant in most countries. These conditions were largely due to obstetric causes, and an inquiry into maternal mortality might not only indicate means of reducing the death rate among women, but also of lowering neo-natal mortality. Speaking of the courses of study, the so-called interchanges, which have taken place in three countries during the past year, Miss Lawrence referred to the new type of health work in Yugoslavia—one of the countries in question—designed to improve social and economic, as well as health, conditions. This departure in the Balkans had been investigated by a group of fourteen health officers, who also spent a fortnight in Rumania, studying new features of the health and medical work there. She also mentioned that several schools of hygiene, which had been established in different countries for the training of public health officers, had been exchanging experience and comparing methods, and the Health Organization had fostered this exchange by bringing the directors together for consultation and discussion; meetings for this purpose had been held during the last year in Dresden and Paris. The discussion on the health work of the League, following Miss Lawrence's able summary, was continued by Sir Deva Prasad Sarvadhicary, former vice-chancellor of Calcutta University, who mentioned the work on plague in India, and also the need for obtaining a polyvalent serum for snake-bite; by Viscount Inoue, member of the Japanese House of Peers, who testified to the interest of Japan in the development of public health in China; by M. Zumeta, delegate of Venezuela, who suggested that the League should collect a body of information regarding medicinal plants, many of which, he said, were of specific value in certain diseases, but were quite unknown outside the regions in which they grew; and by Mr. P. E. Coleman, a member of the Commonwealth Parliament, who said that in his view the League of Nations had achieved its greatest success in the field of health. He also stated that the studies of the Cancer Commission of the League had been of special value to the Australian Government, which had purchased large quantities of radium. Australia was also particularly interested in the inquiry made by the League into the health position of certain Pacific islands. Altogether, no one had anything but bouquets for the work of the Health Organization, and the Financial Committee passed without criticism the health budget for 1931, which involves an expenditure greater by £7,000 than the estimates for 1930, and by £15,000 than the actual expenditure for 1929. The Health Committee is appointed for terms of three years, and the new committee, the third in the history of the League, is holding its first session at Geneva at the end of September.

THE HISTORY OF RUBELLA.

IN the July issue of the *Archiv für Kinderheilkunde* Dr. Max Dirrigl of the children's clinic at Würzburg gives an instructive account of the history of the disease known in this country by the name of German measles, rubella, or its German name of röteln. It may be said in passing that, though the "h" in röteln, as in most other words formerly containing "th," has been omitted for the last thirty years in Germany, this fact has not been generally recognized by British or American writers. The term rubella, introduced by Veale in 1866, does not appear to be used except in English medical literature; but in Germany, as in other countries, rubeola is the usual synonym. According to Dr. Dirrigl this term first appears in literature in a Latin translation published at Vienna in 1492 of a work by Ali Ebn Abbas, a Persian physician of the tenth century, entitled *The Knowledge and Cure of Diseases.* Subsequent writers seem to have attached widely different meanings to the word. Baillou (1574), for example, applied it to scarlet fever, Platen (1643) to small-pox, and Sauvages (1649) to measles. Ludwig (in 1758), who seems to have been the first to differentiate röteln from measles, spoke of it as a milder disease, and the same view was expressed by Fritsch in a note in his translation of Cullen's nosology, in 1786. The earliest epidemic occurrence of rubella was noted by Jahn of Rudolstadt in 1807, but it was not until 1834 that the first detailed description of the disease was given by Wagner in Hufeland's Journal, followed by Thomas in 1872 in his article in Ziemssen's handbook. In France the autonomy of rubella was maintained by Trousseau (1866), and in Russia by Nymann (1877) and Enko (1880) of St. Petersburg. This view, however, did not receive general acceptance until the International Medical Congress held in London in 1881, when, as the result of the communications of Cheadle, Eustace Smith, Squire, Shuttleworth, and Charles West, the existence of rubella as a disease *sui generis* was finally established, in spite of the opposition of such notable authorities as Hebra and Kaposi, who maintained similarly that variola and varicella were manifestations of one single disease.

TWINS.

THE study of twins is interesting from many points of view. To the eugenist it suggests the possibility of evaluating the relative importance of "nature" and "nurture," because, *if* one could measure the qualities—physical, physiological, and psychological—of monozygotic twins brought up under different environments, one would have as close an approximation as possible to a measure of pure environmental influence. To the physiologist or paediatrist it is of interest to compare the anthropometric and physiological characters of twins with those of their brothers and sisters, since in this way some light might be thrown upon the respective shares of pre- and post-natal environmental factors in development. The current

number of the *Annals of Eugenics* contains the first part of a memoir by Dr. Percy Stocks,[1] describing the results of a research into the characters of twins, based on measurements made in the elementary and central schools of the London County Council. Dr. Stocks has dealt, *inter alia*, with height, weight, head measurements, blood pressure, pulse rate, respiration rate, and eye colour. He has determined averages, measures of variation and of correlation, while taking care to allow for age in determining the weight of differences. It appears that monozygotic twins tend to be taller and heavier than dizygotic twins, while their brothers and sisters occupy an intermediate position as regards height, but are superior to both in weight. Monozygotic twins, and to a less extent dizygotic twins, tend to have higher blood pressure and quicker pulse and respiration rates than their brothers and sisters at the same ages. The degree of resemblance between brother and sister born at different times is the same as in pairs of like sex born at different times, and the degree of resemblance between dizygotic twins is not appreciably different from that met with in all pairs of children born to the same parents at different times. Although at birth the mean difference in respect of various characters between members of a monozygotic pair has been shown to be of the same order as that separating members of a dizygotic pair, before school age is reached the former difference is approximately half the latter in respect of static characters and weight. This differentiation occurs later in respect of blood pressure. Various attempts have been made to evaluate the respective shares of "nature" and "nurture," and Dr. Stocks points out the objections to which these are open; tentatively he is inclined to rank height, weight, head dimensions, blood pressure, pulse, and respiration rates as in descending order of relative potency of constitutional to environmental influences. A very interesting section of the memoir is devoted to the problem of obtaining a practically applicable diagnostic criterion of monozygotism, since information as to the existence of a separate chorion will rarely be available when one has to deal with adults, while mere facial likeness may be misleading. It is, as Dr. Stocks points out, extremely easy to reason in a circle. If, for example, we assume that such or such a proportion of like-sexed twins are monozygotic, the fact that a particular diagnostic criterion assigns this proportion of monozygotic twins in an examined sample only justifies the diagnostic method if the assumption is certainly correct. Hence Dr. Stocks has applied a number of tests which, even if some of them depend on assumptions, are at least partly independent, and, although he modestly fears that he himself may not altogether escape the charge of circular reasoning, his methods seem to us cautious and satisfactory. He concludes that the most satisfactory method is one which requires four head measurements and the child's finger-prints, but that a reasonably good result can be obtained from finger-prints alone. Clear practical instructions for the carrying out of the tests are provided. It is perhaps superfluous to say that this memoir reaches the usual high standard of the Galton Laboratory in presentation and format.

RICHARD VON VOLKMANN.

IN a sympathetic memoir[2] Professor Willy Anschütz of Kiel describes the life and work of Richard von Volkmann, the pioneer of antiseptic surgery in Germany, on the occasion of the celebration of the centenary of his birth on August 17th. The son of Professor Alfred Wilhelm Volkmann, a distinguished anatomist and physiologist at Halle, Richard showed no special gifts in his early years, and it was not until 1856, shortly after his qualification, when he had to act as deputy for his sick chief, Professor Blasius, director of the surgical clinic at Halle, that his abilities as a surgeon blossomed forth. Ten years later he succeeded Blasius in the chair of surgery at Halle, and, in addition to making valuable contributions to surgery and pathology, founded the well-known collection of clinical addresses to which his name is attached. Returning to Halle after the Franco-Prussian war, the prevalence of wound infection raised the question of the necessity of closing the clinic. As a last resource, however, Volkmann with some misgiving introduced Lister's antiseptic method, with such marvellous results that for many years his clinic at Halle became the Mecca for surgical pilgrims. In addition to bone and joint surgery, which had always been his favourite subject, Volkmann contributed much to the advancement of orthopaedics, since he possessed a gift for technique and the solution of mechanical problems. Mention should also be made of his work on cancer, particularly in relation to its occurrence among workers in tar and paraffin. Besides being a bold and successful operator, Volkmann was an excellent teacher, and counted among his pupils such well-known surgeons as Schede, Kraske, Sprengel, Fedor Krause, Heinrich Braun, and Heidenhain. Volkmann died at the comparatively early age of 59, at the height of his fame. His native town of Halle, of which he had been made a freeman, erected a statue of him in front of the clinic where he had worked with such distinction.

THE BRITISH ASSOCIATION'S APPEAL.

IN our notes on the recent annual meeting in Bristol of the British Association for the Advancement of Science we mentioned on September 13th (p. 440) that it was intended to appeal for £40,000 as a centenary endowment fund. Research has always been one of the primary interests of the British Association, and several important investigations have been endowed by it. There are normally in existence about seventy committees concerned with such researches, or with inquiries into the state of various branches of science. Grants have been provided for materials and instruments, as well as for publication of the results. Payments are not made to research workers, the Association being essentially an organization for the encouragement of voluntary work in the cause of science. Apart from the publication of its annual report and other necessary printings, which form a large item in the general accounts, there has hitherto been no systematic provision for issuing a full record of the transactions at the annual meeting. In undertaking the custody of Down House the British Association accepted liability for about £3,000 towards the restoration of the property, and there are further commitments for upkeep. The cost of celebrating the centenary next year in a fitting manner is another item of unavoidable expense. It is hoped that a generous response to the appeal will enable the Association to extend its support of research, to ensure the means of carrying out its imperial responsibilities, and to increase the facilities offered to junior students of science, besides meeting those obligations which have already been mentioned. Contributions should be sent to the General Treasurer, British Association, Burlington House, W.1.

THE Harveian Oration will be delivered before the Royal College of Physicians of London on Saturday, October 18th (St. Luke's Day), at 4 o'clock, by Professor John Beresford Leathes, M.B., F.R.S.

THE Schorstein Memorial Lecture will be given by Mr. H. S. Souttar, F.R.C.S., at the London Hospital Medical College on Friday, October 17th, at 4.15 p.m. His subject is radium in the service of surgery. Members of the medical profession are invited to attend.

[1] A Biometric Investigation of Twins and their Brothers and Sisters. By Percy Stocks, M.D., D.P.H. From *Annals of Eugenics*, vol. iv, Parts I and II, 1930. Cambridge University Press.
[2] *Forschungen und Fortschritte*, August 1st and 10th, p. 299.

THE DIETETIC TREATMENT OF LUPUS VULGARIS.

A VERY interesting clinical experiment is now being conducted by Professor Jesionek at Giessen, where he is in charge of the dermatological clinic of the local university. Professor Jesionek is also the head of a hospital of over 180 beds, all of which are devoted to lupus vulgaris, with the exception of a very few filled with patients suffering from allied conditions. This hospital is the only one in Germany exclusively devoted to this disease, and the only other hospital in Europe of which we are aware which admits sufferers from lupus alone is the Finsen Institute at Copenhagen.

The hospital at Giessen was first erected in 1913, and had originally twenty-eight beds only, but since the war it has grown very considerably. Professor Jesionek has been in charge of it since the first, and its present size and importance is largely due to his efforts, and to his success in persuading the local authorities to finance the building and find the necessary funds for the upkeep of the institution. Professor Jesionek is well known to our profession as a prominent worker in actinotherapy, and of course light, both natural and artificial, has played a conspicuous part in the treatment of the patients. He greatly prefers natural to artificial sunlight when he can get it, and the hospital, which is situated at the top of a hill, and looks south-east over open country, is well placed to take advantage of all the sunlight there is; but for many months in the winter season there is little sunshine, and he is compelled to fall back upon artificially produced ultra-violet light. He himself has devised a special form of mercury vapour lamp, which is well known in this country.

Up to recent years the treatment of the patients has largely consisted of the judicious use of actinotherapy combined with every agency which may help to improve the general nutrition, and especially to bring the skin itself into the healthiest possible condition. Professor Jesionek works on the theory that in the skin there resides the chief antituberculous defences of the body, and he employs light solely as a stimulus to the skin to make it produce fluids of high antituberculous value in large quantities. He sedulously avoids any suspicion of an inflammatory reaction, for that would mean that the skin had sustained injury, and, in consequence, diminution of its antituberculous power. In addition to light he also advocates the employment of other agencies such as exercise, exposure of the skin to fresh air, and the use of cool baths—all for the purpose of improving the cutaneous condition. Locally he employs the Kromayer lamp, and does not despise the older methods of erasion and the use of chemical caustics. He does not, however, use the Finsen lamp, or its more manageable modification, the Finsen-Reyn. The chief reason is the great expense involved, owing to the necessity of having a nurse in attendance the whole time for each patient, and money is very scarce in Germany at the present time. But the experiment which is now being conducted at this institution has nothing to do with light. About two and a half years ago Professor Jesionek began tentatively to employ in a few cases the dietetic treatment of lupus on the lines first suggested by Gerson, and subsequently developed by Bommer, Sauerbruch, and Hermannsdorfer. This originally consisted in the administration of an absolutely salt-free diet—that is, sodium chloride-free. Such a diet being extremely unpalatable to many people, a special mixture of salts (excluding, of course, sodium chloride) termed "mineralogen" was given instead. In addition to their food the patients were given a teaspoonful of phosphorized cod-liver oil three times a day.

At the outset only a dozen patients were put on this dietetic treatment, and at the same time the usual routine actinotherapeutic measures were continued. But, quite contrary to the professor's expectation, these patients underwent remarkable improvement, and since then more and more have been put on this dietetic treatment, until at the present time all patients, without exception, are treated dietetically, and the other more conventional methods of treating lupus have fallen more and more into the background. While all the patients are treated dietetically, they are not now given quite the same diet as they were at the outset of this large experiment. The leading feature of the original Gerson diet was the complete absence of ordinary table salt; in the diet now given in the Giessen Hospital salt is still absent, but the essential feature of the regime at the present time is rather the fact that all the food is uncooked. The special "mineralogen" mixture is dispensed with, and latterly even the administration of cod-liver oil has been discontinued, but the results of the diet are still excellent. These results are quite consistent with Professor Jesionek's theory of the incidence of tuberculosis. He is never tired of pointing out that tuberculosis is exclusively a disease of civilized man and domesticated animals. Both men and beasts living in a wild state are free from it, owing to the fact that their skins are able to produce antituberculous fluids in sufficient quantity to destroy at once any tuberculous bacilli with which they may come in contact. When civilized or domesticated this property is greatly diminished, and in consequence the man or animal becomes liable to tuberculous infection. The whole basis of the treatment of tuberculosis should be, according to Jesionek, the restoration of the skin to its natural state, with adequate power for the production of antituberculous bodies. It is exclusively with this object that he employs actinotherapy, baths, and exercises of various kinds. The new dietetic treatment falls in line easily enough with this theory. Men and animals living uncivilized and undomesticated existences, and consequently free from tuberculous troubles, eat their food raw, nor do they take salt with it. Consequently, he holds that the diet now administered at the Giessen Hospital gives a further opportunity for the patients to approach the conditions under which their skins may acquire once more their antituberculous properties to the fullest extent.

The practical side of the dietetic treatment of lupus is not without its difficulties. Owing to the fact that many patients find saltless food very dull, meals are kept to very small dimensions but given at frequent intervals, and there are no fewer than seven meals per diem. The food is of a mixed character (for it is uncertain whether the food of primitive man was animal or vegetable or mixed in character), containing a small quantity of meat, but fruits and vegetables form an important part. Eggs, milk, and butter are also given freely. It need hardly be said that all smoked and salted articles of food are religiously eschewed. When the present writer visited the hospital he saw a number of cases of great severity and long standing which had resisted all attempts to cure them until they had been put on the dietetic treatment, and which now had either completely recovered from the disease or at all events were within a little of that achievement. None of them had been dieted for more than two years, and most of them much less. At the same time their general health had been well maintained, and there had been a moderate increase in weight.

Professor Jesionek and his assistant Dr. Bernhardt have published a booklet on the dietetic treatment of lupus and the biology of nutrition, which details their results up to January, 1930.[1] Up to that time 341 patients had been treated, but by now the number must have been greatly increased. They give very convincing illustrations of the benefit received by patients suffering from obstinate and widespread lupus, and there is no doubt that the possibility of the cure of lupus vulgaris by means of diet has been proved. Whether there is much need for those of us in this country who have charge of lupus cases to adopt this method of treatment is another matter, and, moreover, it would be quite impossible to carry it out on out-patients, as are most of our lupus cases. On the other hand, it is undoubtedly worthy of study by those who are responsible for the public health of large districts and who maintain large hospitals containing many patients suffering from both lupus vulgaris and surgical tuberculosis (for the dietetic treatment of the disease applies also to the latter). The whole subject certainly deserves examination by the medical departments of the L.C.C. and other county councils who are responsible for the treatment of large numbers of tuberculous patients and into whose hands finally gravitate the most obstinate and difficult cases.

H. HALDIN-DAVIS.

[1] *Diätetische Behandlung der Hauttuberkulose und Ernährungsbiologie.* By A. Jesionek and L. Bernhardt. 1930. Leipzig: J. A. Barth. R.M. 6.

Scotland.

Vital Statistics for Scotland in 1929.

THE seventy-fifth annual report of the Registrar-General for Scotland, dealing with the year 1929, has just been published. The population of Scotland in the middle of the year is estimated to have been 4,384,032, which is 9,150 less than the estimated population of the previous year owing to the net emigration having been greater than the excess of registered births over deaths. The births registered during the year numbered 92,880, giving a birth rate of 19.02 per 1,000. This number is 3,942 less than the number for the previous year, and is the lowest recorded in any year since the introduction of registration in 1855. The maximum birth rate recorded was 35.62 in the year 1876. Up to the year 1893 the Scottish birth rate was always over 30 per 1,000, and from 1894 to 1914 consistently over 25. Since 1921, the rate has always been under 25, and since 1926 under 20. The Scottish birth rate compares favourably with that of England and Wales, which was 16.3 per 1,000, while that of Northern Ireland was 20.4, and that of the Irish Free State 19.8. The deaths registered during the year numbered 70,917, giving a death rate of 14.52 per 1,000. The number of deaths exceeds that of the previous year by 5,646, and the death rate, 14.52 per 1,000, is the highest Scottish death rate since 1922. In the preceding year the death rate was 13.34 per 1,000; the rise is attributed to a severe epidemic of influenza which occurred during the earlier months of 1929. The infantile mortality rate for the year was 86.8 per 1,000 registered births, which is higher by 1.1 than that of the previous year, but lower by 2.4 than the mean of the preceding five years, and lower by 4.2 than the mean of the preceding ten years. The only years in which the Scottish infantile mortality rate was lower were 1923, 1926, and 1928, when the rates were 78.9, 83.1, and 85.7 respectively. Previous to 1915 this rate was always over 100, and exceeded 130 on eight occasions. The number of centenarians whose deaths were recorded in 1929 was 14, of which 10 were verified. In the last twenty years 281 reputed centenarians have been recorded and their ages investigated, with the result that the attainment of an age over 100 has been verified in 139 cases, disproved in 43, while in 99 cases confirmation could not be obtained.

Causes of Death.

The 70,917 deaths registered in Scotland during 1929 included 35,386 males and 35,531 females. Compared with the figures of the previous year the excess of male deaths was 2,809, and of females 2,837. The total number of deaths exceeded that of any year since 1922, but was less than that registered in any year between 1863 and 1915. The death rate in the male population was 15.09, and in the female 13.99 per 1,000. With regard to age at death 12,201, or 17.2 per cent., were children of less than 5 years of age, 40.6 per cent. were persons between 5 and 64, while 42.2 per cent. were persons aged 65 and upwards. The number of deaths at ages under 5 was 345 less than in the previous year. The infantile mortality rate for the year among male children was 97.3 per 1,000 and among female children 75.7, the male infantile mortality rate exceeding the female by 21.6. Deaths from enteric fever during the year numbered only 18, which is the smallest number yet registered in any year. In 1865, which was the first year in which deaths from enteric fever were shown separately, these deaths numbered 1,048, and fell below 1,000 for the first time in 1883; since then they have been progressively diminishing. For the second year in succession no death has been registered as due to typhus fever in Scotland, and for the eighth consecutive year no death has been registered as due to small-pox. The number of deaths attributed to measles was 149, which is 856 less than in the previous year, 790 less than the mean of the preceding five years, and 900 less than the mean of the preceding ten years. This is the smallest number of deaths from measles registered in any year since 1855, the previous smallest being 512, which occurred in 1925. All the deaths, with the exception of 4, were of children under 10 years of age. Deaths from scarlet fever numbered 109, which is the smallest number of deaths from this cause recorded since 1855. The number of deaths from whooping-cough was 901, being 171 less than in 1928. Of the 901 deaths, all occurred among children under 10 years of age, with the exception of 4. Deaths attributed to diphtheria numbered 471—17 fewer than in the previous year. With the exception of 40, these deaths occurred among children under 10 years of age. Deaths attributed to influenza during the year numbered 3,435, giving a death rate of 70 per 100,000, which is the highest number of deaths from influenza in any one year since 1922, and 2,474 more than in the previous year. The number of deaths attributed to all forms of tuberculosis was 4,580, which is 142 less than that of the previous year, 519 less than the mean of the preceding five years, and 941 less than the mean of the preceding ten years. This is the smallest number of deaths from tuberculosis recorded since 1855, the previous smallest number being 4,722 in 1928. The maximum number of deaths from tuberculosis in Scotland was 13,027, which occurred in 1870. The number of deaths fell below 10,000 in 1888, below 8,000 in 1914, below 6,000 in 1921, and below 5,000 in 1926. Of the 4,580 deaths from tuberculosis, 3,288 were ascribed to tuberculosis of the respiratory system, 519 to tuberculous meningitis, 303 to tuberculosis of the intestines, 65 to tuberculosis of the spine, 40 to tuberculosis of joints, and 365 to tuberculosis in other sites. Deaths from cancer and other forms of malignant disease numbered 7,108—207 more than in the previous year, 381 more than the mean of the preceding five years, and 755 more than the mean of the preceding ten years. The death rate from this cause was 146 per 100,000, which is the highest death rate yet recorded, the previous highest being 141 in 1927 and 1928. The death rate from cancer is now more than twice as high as that from respiratory tuberculosis, and indicates a great change from the year 1879, when the death rate of respiratory tuberculosis was over four times as high as that of cancer. Of the deaths from cancer, 91.2 per cent. occurred among persons aged 45 and upwards. The commonest sites were stomach (857), intestines (537), rectum (239), liver (187), prostate (149), tongue (105), oesophagus (159), and lung (116). Deaths from diabetes numbered 616, and were 93 more than in the previous year, 115 more than the mean of the preceding five years, and 121 more than the mean of the preceding ten years. Of the 616 deaths, 231 occurred in males and 385 in females. Deaths attributed to accidents of pregnancy and parturition numbered 638, which is 38 fewer than in the previous year. Of these, 221 were attributed to puerperal sepsis, this number being 13 less than in the previous year. These deaths were equivalent to a death rate of 6.9 per 1,000 registered births, which is 0.1 less than the death rate of the previous year.

Vaccination of Children.

An appendix to the Registrar-General's report for 1929 deals with the vaccination of children born in Scotland during 1928, who should have been vaccinated during that year or during the first half of 1929. Of the 96,869 children born in 1928, 6,648 died before reaching the age of statutory vaccination (six months). Of the 90,221 children surviving, 58.13 per cent. were certified to have been either successfully vaccinated or reported to be insusceptible. Unvaccinated cases constitute 40.43 per cent.; the majority of these children, or 33.91 per cent. of the total, were unvaccinated by reason of a declaration of conscientious objection on the part of the parents. The percentage vaccinated is 2.58 less than in the previous year. It is pointed out that after the passing of the Vaccination (Scotland) Act, 1907, the number of vaccinated children continued to diminish, reaching a minimum of 54.49 in the year 1918; in 1920, following an epidemic of small-pox, the rate rose to 70.54, and thereafter continued to fall again.

Conference of Cremation Authorities.

At the ninth annual conference of cremation authorities, recently held in Edinburgh, Dr. A. A. Mussen, medical officer of health for Liverpool, supported the suggestion that the statutory regulations for cremation and the certificates B and C should be included as part of the study of medical students in their last year of training

in all universities and medical colleges. Although most medical practitioners, he thought, were in favour of cremation, it was advisable that medical students should be more precisely informed of its advantages and instructed in the proper filling up of the various forms. This was done at Liverpool, where the medical students were taken round and shown the working of the crematorium. It was difficult to persuade people to regard cremation as a serious proposition, but he was of the opinion that the movement was making satisfactory progress. Dealing with the question of the adoption of uniform standard forms by all cremation authorities, Mr. J. Dan Easson said that in his experience doctors sometimes made mistakes in filling up the forms. He suggested that certain short instructions should be printed in bold type, so that doctors might have them brought before their eyes at once. A great deal of trouble and expense might be saved in consequence. It was often very difficult to get any mistake made by a doctor rectified in the short time available between the receipt of the application and the time appointed for cremation. If there was one standard type of instructions doctors would know exactly what they had to do. In opening the discussion on cremation from the public health point of view, the chairman, Mr. Murray N. Phelps, LL.B., said that between 4,000 and 5,000 deaths were registered every year without any medical certificate as to the cause of death. Although the details of such cases were remitted to the coroner, there was urgent need for the revision of the rules affecting certification where burial was the method adopted. Mr. G. Noble, representing the Cremation Society, emphasized that cremation was a matter of the utmost importance to the health of the living and ought to be more closely considered by the sanitary services. In this connexion the proposal was made by another member that its regulation should be transferred to the Ministry of Health. Among other subjects discussed was the attitude of undertakers towards cremation, and the reduction of fees in the case of persons insured under the national health insurance scheme. A number of addresses were read at the conference, which included papers by Professor S. A. Smith of the University of Edinburgh on cremation and crime, by Rev. Dr. George Christie on the Church and cremation, and by Dr. J. J. Jervis, medical officer of health for Leeds, on public health authorities and cremation. The proceedings concluded with a visit to the Glasgow crematorium by about forty of the delegates and their friends.

Dundee Royal Asylum.

The one hundred and tenth annual report of the Dundee Royal Asylum, including that of Dr. Arthur B. Dalgetty, medical officer of the institution, states that 57 patients were on the register at the close of the year ended June 16th, 1930. Of these, 20 patients were admitted, including 15 voluntary patients and 5 under certificate. Fifteen were discharged, and 8 died. Of the 15 discharged, 14 were voluntary patients, most of whom had derived benefit from their stay in the hospital. The report points out that the excess of voluntary patients over those certified indicates that full advantage is being taken of the method of voluntary entrance, and that it works in a very satisfactory manner.

Royal Asylum of Montrose.

The report of the Royal Asylum of Montrose for the year ended May 15th, 1930, including the report of Dr. C. J. Shaw, physician-superintendent of the institution, states that the number of patients on the register at the end of the year was 745. During the year 66 men and 64 women were admitted, while the number of discharges was 68. Of the latter, 43 patients left the institution recovered, 12 relieved, and 13 not improved. There were 78 deaths—38 of men and 40 of women—which gave a death rate, calculated upon the average number resident, of 10.4 per cent. The average age at death was 65.25 years. Six of the deaths were due to tuberculous disease, from which the patients suffered on admission. Thirteen deaths resulted from diseases of the nervous system (one from general paralysis), and 33 from senile decay. There were 44 voluntary patients resident at the beginning of the year, and 32—22 men and 10 women—were admitted. In this year for the first time two voluntary patients were admitted chargeable to a parish, and the hope is expressed that this procedure will now be more largely adopted. No change is reported among the service patients, who numbered 31 altogether, including 5 officers. As conditions predisposing to mental breakdown, heredity was noted in 44 instances, alcoholic intemperance in 13 cases; in 7 cases the illness was stated to be due to financial and business worry, and in 5 cases to privation. Only 2 patients with general paralysis were admitted during the year, which is the lowest number on record. Thirty-one patients suffered from melancholia, 12 from mania, 24 from dementia of various forms, and 17 from senile dementia.

England and Wales.

Home Ambulance Service.

In its report for the quarter ended June 30th, 1930, the Home Service Ambulance Committee of the Order of St. John and the British Red Cross Society (12, Grosvenor Crescent, S.W.1) directs attention particularly to that branch of its work which is concerned with the care and transport of the sick. The extension of institutional treatment, which has followed the improvement of hospital facilities and their adaptation to the requirements of those who can afford to pay for the service they render, has emphasized the need for unremitting effort in maintaining the efficiency of this department. As the committee remarks, a hospital or well-equipped nursing home is a doctor's workshop, where repairs can be most effectively carried out, but much of the success of institutional treatment in serious cases of illness must depend upon the skilful conveyance of patients from their homes. During the quarter the number of patients carried in ambulances was 28,204, bringing the total number conveyed since the organization of the service up to 901,451. The figures for road casualties dealt with during this summer are not yet available, but over 10,000 patients are reported to have been treated by members of the Order and Society at their roadside first-aid stations last year. This estimate refers mainly to accidents that happened during week-ends and holidays. While continuing to urge the provision of first-aid facilities in every town and village in the country, the committee recognizes the good will and devotion demanded of its voluntary roadside workers, who spend many tedious hours in waiting for accidents to occur. It suggests that with accumulating experience units will be able to adjust their schemes to local conditions so as to provide the most useful service in their power without unnecessary expenditure of energy.

Post-graduate Work in Manchester.

In 1927 the University of Manchester appointed a medical post-graduate committee with the object of arranging fresh courses and of co-ordinating the not inconsiderable amount of work already done by the Manchester Hospitals. The trial period of three years has now elapsed, and, with this experience of the past to help, courses have now been arranged for the year 1930–31. It has been learnt that, while Manchester does not attract visitors from outside, there is a definite demand for special work by those in Government and other services in the district, and also that practitioners desire isolated lectures in subjects of interest. The general trend is for the Royal Infirmary to specialize in student teaching and for the Ancoats Hospital to afford post-graduate clinical work. At the latter hospital clinical cases, laboratory demonstrations, and x-ray examinations will be available each Thursday in term time at 11 a.m. Clinical assistantships, including one in radium therapy, are available at some of the special hospitals. Part-time courses will be given during the year in ophthalmology, dermatology, minor operations (Salford Royal Hospital), and bacteriology. The Royal Infirmary will hold its usual courses of afternoon lectures at 4.15; those on Tuesdays will be given by the honorary staff, those on Fridays will be of a more technical nature,

given by outside practitioners. Among these are Dr. Lane on lead, Mr. W. Woods, F.R.C.V.S., on the veterinary side of tuberculosis, Dr. David Blair of the Prestwich Mental Hospital on mental defect and exhaustion, and Mr. Gordon Whitehead on gonorrhoea.

On Friday, November 7th, Dr. E. W. Barnes, Bishop of Birmingham, will give the seventh Lloyd Roberts Lecture, on heredity and predestination. This will be given in the Physiological Theatre of the University, at 4.15 p.m.

The London Hospital.

In the absence of Lord Knutsford, Sir William Paulin, treasurer of the hospital, presided over the quarterly general court of the London Hospital, which was held on September 3rd. According to the statement presented by Mr. Elliot, now house governor in succession to Mr. E. W. Morris, the hospital waiting list stood at 1,100, in spite of the fact that there was a slight falling off in the daily number of patients. On an average three emergency operations were performed each night. The children's out-patient department was nearing completion, and would shortly be ready for occupation. The cost of the work—namely, £5,714, had been covered by the sum of £4,386, which had been contributed in response to a special appeal by Lord Knutsford, and a cheque for the balance of £1,328, which had been sent to the hospital by Mrs. C. C. Croft. The diagnostic apparatus in the *x*-ray department was of an obsolete type, and was being replaced by the most efficient apparatus at present available. It would now be possible to take radiographs of the chest at a distance of 6 feet, and with a tenth of a second exposure, thereby reducing distortion to a minimum. The apparatus for *x*-ray treatment was also being replaced, and arrangements were being made to accommodate it on a better site. Towards the total cost of the new equipment—£6,375—the hospital had £4,694 in hand. A new heart department was to be built next to the west wing, the General East End Tradesmen's Association having generously undertaken to cover the cost, which would amount to £6,500. Also under consideration was a project to build a massage and electrical department on a site at the west end of the out-patient department, in order that the two departments, at present some distance from each other, should be in close proximity. Reference was made in the report to the investigations by which Drs. S. P. Bedson and G. T. Western had shown psittacosis to be due to a filterable virus.

Correspondence.

A LABORATORY DIAGNOSTIC SERVICE.

SIR,—In your issue of September 13th (p. 418) Dr. W. G. Willoughby makes a powerful case for the extended provision of laboratory methods of diagnosis, and urges that a service for this purpose should be established in connexion with the public health departments of the country. Of the need for the general provision of such a service there are no two opinions; whether it is desirable that it should be developed as a part of the public health service is open to debate.

The public health service plays a valuable part in the control of the mass health; its officers have special knowledge in this direction and special means at their disposal to this end. The health of the individual is dealt with by a different service, with its own officers (the medical practitioners of the country) and its own institutions, the most important of which are the great voluntary hospitals so widely spread throughout the land. The voluntary hospitals focus the medical activities of their own districts and of the country as a whole, and it would appear that it should be through them that such a pathological service should be conducted. No doubt in the future the municipal hospitals will also be able to take a part in this work.

The need for some general diagnostic service, open to those unable to pay large fees or any fees at all, is mainly felt by those medical practitioners working under the National Health Insurance Acts. For those able to pay even moderate fees there is no difficulty in providing all the laboratory facilities necessary. It is the patients of the panel doctor who are most often unable or unwilling to pay laboratory fees. The national health insurance system covers an immense number of individual patients, and if dependants come to be included the system will cover the bulk of the population; on the face of it it would appear that it is as a part of the national health insurance system that any general service for the provision of laboratory facilities should be developed.

Dr. Willoughby does not suggest that it is desirable that such a diagnostic service should be run in connexion with laboratories already established by the public health authorities. He recognizes that there are "important reasons for the employment of the best pathologists" because "they can frequently assist the clinician in the interpretation of results." This is a point of the utmost importance. The work of a public health pathologist and that of a clinical pathologist differ widely; both require special knowledge, but that special knowledge covers entirely different fields. The avenue of approach in the laboratory investigation of a case and skill in the interpretation of the results of such investigations can only be learned by long experience gained in close contact with individual patients, and such experience can only be satisfactorily acquired in the wards and pathological department of a general hospital.

The pathological departments attached to the general hospitals throughout the country would then appear to be the ordained places for the development of such a service, Most of the larger voluntary general hospitals already possess well-equipped pathological departments with experienced and efficient staffs. Those which so far have been unable to afford the cost of maintaining such departments would speedily establish them could they be assured of a steady flow of paid work which would assist in their maintenance.

The pathological department, on account of its diagnostic work, is one of the most important of the special departments of the modern hospital; it is, further, unusual to find a pathological department in which some effort at research is not being made. A laboratory diagnostic service working through the pathological departments of the general hospitals would therefore not only in itself be the means of advancing the standard of medical practice throughout the country, but would also serve materially to increase the efficiency of the general hospitals.

It is the belief of this association that such a service could be conducted in this way, and that it would be of great benefit to the community. All those interested in this very important question must be indebted to Dr. Willoughby for having so forcibly drawn attention to a crying need.—We are, etc.,

J. G. GREENFIELD, M.D., F.R.C.P.,
Vice-President,
S. C. DYKE, D.M., M.R.C.P.,
Secretary,
The Association of Clinical Pathologists.

Wolverhampton, Sept. 15th.

MASSIVE COLLAPSE OF THE LUNG.

SIR,—Dr. J. M. Woodburn Morison, in his British Medical Association Lecture delivered to the Dundee Branch on April 29th, and published in the *Journal* of August 16th (p. 237), concludes that massive collapse of the lung is due to a spasmodic contraction of the muscle-reticulum of the organ, the function of this musculature being deranged by various causes acting upon the vagal and sympathetic innervation directly or reflexly. He quotes Rose Bradford, who holds that there is a reflex stimulation of constrictor nerve fibres to the muscles of the bronchioles. He also mentions Sante, who believes that such stimulus is derived from a toxic condition, from an interference with the nervous supply of the vagus, and from abdominal or chest injuries or operations. He regards the acute dilatation of the stomach which may follow a laparotomy as an analogous condition.

In a previous communication (*Journal*, 1927, vol. ii, p. 985) I suggested that such phenomena of violent aberration from the normal on the part of the trophic nerve mechanism are due to reflexes or toxins influencing subjects

who are hypersensitive and exhibit the phenomena of anaphylaxis. Such a hypothesis alone can explain the occurrence of these conditions in some subjects and not in others. The causal factors are repeated in case after case; only some patients develop these phenomena.

Why do some old people with advanced arterio-sclerosis suffer from attacks of acute pulmonary oedema, a condition so fulminating that it could be regarded as an acute and violent outbreak of trophic mania? The inciting cause is probably the exposure to cold during undressing and on getting into bed between cold sheets. Why do some of us sneeze, and afterwards develop a coryza, on exposure to cold air, the sneezing being due to an abnormal hyperaemia of the nasal mucous membrane as the result of a nerve reflex from the cold? Probably the same reflex starts a pneumonia. The nerve reflex explains the upset of the trophic reason, but why does such an abnormal result, threatening and often causing death, ever occur? Because the underlying condition of hypersensitiveness is present.

In the *Annals of Surgery of Philadelphia*, May, 1930, Drs. Wilmer, Cobe, and Lee report the results of an investigation into the incidence of allergy and asthma in a group developing post-operative atelectasis. They prove to their own satisfaction that such incidence undoubtedly occurs. This confirms my contention, which was arrived at on purely theoretical grounds, but the truth of which I have proved by continuing to give a desensitizing dose (0.3 gram) of peptone fourteen hours before every laparotomy to the patients operated upon at our War Memorial Hospital. The results have been startling, and continue to be so.—I am, etc.,

Melton Mowbray, Sept. 14th. MONTAGUE DIXON.

RADIUM THERAPY.

SIR,—My apologies are due to Dr. Stanley Melville (September 13th, p. 448) for the omissions he took exception to in my lecture on the technique of radium therapy to-day. No slight was intended either to the radiologist, to the physician, or to the pathologist. These three must form such an important part of any radiological team that their inclusion was rather taken for granted. The biologist and physicist and other more special laboratory workers do, I fancy, need mention, as though they are just as useful they are perhaps not quite as obvious to the general practitioner, to whom the lecture was delivered. Modesty should have prompted me to omit the surgeon.

In reply to Dr. Howitt Hastings, I would say that almost any form of radium will undoubtedly cure rodent ulcer, and for this treatment, and for this only I fancy, the metal plaque survives. As to the use of radon, we really seem to be quite in agreement. For any service, State or otherwise, run in connexion with a radon-producing establishment has great advantages.—I am, etc.,

London, W.1, Sept. 23rd. DUNCAN C. L. FITZWILLIAMS.

PERFORATING DUODENAL AND GASTRIC ULCERS.

SIR,—To wait for a few hours till shock passes off may be all right under the immediate eye of Mr. Basil Hughes (September 20th, p. 497), but it is dangerous treatment to broadcast, as it might lead to a mistaken policy in other ways—the diagnosis, consultation, removal, etc. For shock give morphine, up to 1/3 grain hypodermically, and operate *at once*. But the shock may be slight, and morphine not required. The shock varies from *nil* to instant death. I thought all that was settled in the nineties. Needless to say morphine is never to be given if the diagnosis and necessity to operate at once are not agreed upon by all concerned, otherwise a dangerous delay may seem justified, so altered by the morphine is the picture (as in other critical states).

Statistics of mortality are not informing unless they embrace the interval of time between perforation and operation. Lundie, early in the nineties, spoke of that interval as "eloquent of the dangers of delay." The mortality is determined, granting the practically equal skill of the modern surgeons who operate on these cases, by (1) the time between perforation and operation, (2) the time since the last meal, (3) the site and size of the perforation; and the second and third factors determine (4) the amount of extravasation. I think these conditions far outweigh in their influence on mortality the difference between skilful ether administration and spinal anaesthesia, with or without local anaesthesia.

I cannot follow Mr. Hughes in his remarks about cigarette smoking. Between thirty-five and twenty-five years ago, when I encountered more of these cases than I do to-day in general practice, women were not smokers, and my impression (possibly wrong) is that there are fewer cases in this "tobacco age" than there were formally. It was in 1895 that I saw my first case of perforated stomach, and in the skilful hands of the late Mr. Kennedy Dalziell it became, I believe, the first case recorded in Glasgow of recovery after operation.—I am, etc.,

Glasgow, Sept. 21st. R. O. ADAMSON, M.D.

CRETINISM WITH GOITRE.

SIR,—I have for some time tried to obtain information as to the existence in Great Britain at the present time of cretinism associated with the presence of a goitre. Several kind correspondents from those regions where goitre is endemic have written to me pointing out the rarity of goitrous cretinism in their own districts, but I have been unable up to the present to find out whether, in fact, any cases illustrative of the condition are now to be found. If any of your readers could send me particulars of such a case, preferably with a photograph showing the condition of the neck, I should be most grateful.—I am, etc.,

64, Harley Street, W.1, Sept. 20th. CECIL A. JOLL.

PYREXIA OF UNCERTAIN ORIGIN.

SIR,—During the last few weeks there have been occurring in this district cases of illness which appear to me to present some novel features; and I should be interested to hear whether other practitioners have come across similar cases.

The illness begins somewhat suddenly with severe headache, usually frontal, sometimes accompanied by vomiting. There is considerable prostration, and pyrexia of 100–103° F. Often photophobia is present. After a few days' rest in bed the headache lessens and the fever subsides, and the patient is usually convalescent within a week. There is one sign, the recognition of which I owe to a colleague, Dr. F. P. Halkyard, that I have found almost always present—namely, pain in the dorsal spine on flexing the head. In most cases there is also definite cervical rigidity. Kernig's sign is doubtful or absent. In some cases I have found the tendon reflexes, especially the knee-jerks, to be somewhat exaggerated.

I write this short note in the hope that some light may be thrown on the nature and cause of the condition. Is it influenzal? If so, the absence of cases of the usual catarrhal type at the present time appears remarkable. Some of my cases have had a rather slow pulse, 40–50 during defervescence, and some have had "girdle pain" in the upper abdomen. There have been several instances of infection from one case to another, and apparently the incubation period is short—twenty-four to forty-eight hours. There have been no ocular symptoms apart from the photophobia, and no local pareses have been observed. In none of the cases seen so far has the illness been sufficiently severe or prolonged for lumbar puncture to be justified.—I am, etc.,

W. HOTSON PALMER, M.B., B.Chir.,
South Lowestoft, Sept. 19th. M.R.C.P.

THE CORONER.

SIR,—It is useless to waste time over this survival from the early Middle Ages. He and his inquest are equally obsolete. The recent Coroners Act has only made the position of the wretched man worse than ever. The legal coroner knows no pathology, the medical coroner knows no law, and woe betide the amphibious coroner who has been called to the Bar but has never practised in court, with an opponent at his side to trip him up if he makes a slip in the law of evidence, and a judge before him who may retort to his efforts, "Mr. S., I have been forty years in

the law, and if what you say is right I have yet to learn my business." I heard this remark in the High Court.

Most of the trouble in the coroner's court comes from ignorance or disregard of those elementary rules of evidence which every practising barrister has at his fingers' ends, and which no amount of reading can ever implant in the non-legal mind. If the coroner was abolished entirely, and his duties transferred to the police magistrates, who could sit, like county court judges, with medical assessors, there would be an end of the conflicting jurisdiction which the recent Act has brought into greater prominence than before. It may surprise many coroners to hear that opinion is not evidence except in the case of experts. A regional pathologist would be such an expert, and his opinion would be evidence.

Cross-examination should be directed to putting one's client's case; but in the formless court of the coroner there are no parties, no issues, no joinder of issue, no counsel, and only too often no law. It is useless to tinker with this hopeless official, who has been the butt of the satirical ever since Shakespeare's grave-diggers in *Hamlet* (Act v, sc. 1): "Is this law?" "Ay; . . . crowner's-quest law." From the writer of *Termes de la Ley* (temp. Henry VIII) to Blackstone there were endless complaints of the incompetence of the coroners.—I am, etc.,

Lewisham, Sept. 16th. GEORGE JONES.

NECROPSIES IN GENERAL PRACTICE.

SIR,—There are two schools of thought on this matter: the one holds that the performance of post-mortems by general practitioners is undesirable because it leads to inefficient work—that is, that the G.P. is not competent to perform necropsies—the second holds that practitioners are competent, and that they ought to hold on to this work because, if they do not, the time is not far distant when there will be no work left for which the G.P. will be held to be competent. This discussion is a particular example of the general problem which faces the profession at the present time. On the one hand increasing efficiency is required in all medical work, while on the other it is being realized that specialism, if it is accompanied by the elimination of the family practitioner, must seriously impair the efficient care of the health of the people.

There seem to be two lines along which the profession can strive to develop so that the family or general practitioner may be saved from extinction, while at the same time that increase of efficiency which is essential may also be attained. These changes take years and come about almost unnoticed. Their general direction ought not, however, to be left to blind chance. It should be purposively pursued by those members of the profession who are concerned. The first change is towards a modified specialization amongst the general practitioners. In each area certain practitioners ought to acquire special experience in one of the special branches—for example, pathology. One or more of them should be given the status of a local appointment (as is done for the factory surgeonship). This is already done in pathology in practice to some extent, although it is not formally recognized. This pathologist ought to be definitely linked up with the pathology department of the nearest hospital. The second and, in my opinion, the more important change is for the general practitioners to take more thought of the extension of their sphere of activity, rather than to try to hold back changes in the nature of their work, changes which are inevitable in any case. This extension of the sphere of the G.P. cannot, and should not, be expected to be accomplished in a year or two. The chief lines of this extension are concerned with the prevention of disease and the study of it in its early stages. I know I am flogging a well-thrashed horse, but the trend of the present discussion convinces me that still more beating is indicated.

What seems to be most necessary is a slightly changed attitude of mind, on the part of the profession, towards the possibility of making up lost ground which the advance of the science—if not of the art—of healing has made inevitable. Having mounted my hobby-horse I *could* ride afar!—I am, etc.,

Redditch, Sept. 20th. HOWARD E. COLLIER.

SIR,—Most general practitioners will freely admit that they dislike performing post-mortem examinations because the process as carried out in private houses is distasteful and unpleasant, but more because the general practitioners who have not made a special study of morbid anatomy and post-mortem methods know that they do not derive all the information they should from the examination. How can they be expected correctly and accurately to interpret post-mortem appearances when the opportunities of making such examinations come their way so fortuitously, so seldom, and in such discouraging circumstances?

A necropsy—especially for medico-legal purposes, with its ensuing bacteriological and chemical inquiries—may require as much planning as a surgical operation, and its successful accomplishment calls for a specialist just as much as the latter does. The letter of Dr. Binns (September 13th, p. 449) does not make out a case against a specialist in post-mortem work, but only for the intrinsic interest of post-mortem findings.

The opportunity was missed years ago. Those responsible for framing the Insurance Act made elaborate preparations for advice (A), visits (V), and certificates (C), and for ladling out gallons of medicine. They even went so far as to discourage peppering the patient with pills, but encouraged the keeping of records. Had they put aside a few pence per head for a pathological service many of these medical records, which now are often merely the data of unsolved puzzles, would have received a welcome amount of illumination and have made an immense contribution to knowledge. The general practitioner who was genuinely in search of the truth could be present at a post-mortem examination made by an expert, and could learn more in an hour in the mortuary than he could in days spent in a library. Any general practitioner so minded could qualify as a specialist pathologist and ask to be put on the panel of pathologists. The coroners would be delighted. Their troubles would be lightened. A non-medical coroner quite recently told me with glee that he had discovered a young medical man with a zest and enthusiasm for post-mortems, and that, for that area at any rate, he knew how to allot the work in future.—I am, etc.,

September 15th. URBANUS.

A VITAL REACTION IN THE DENTAL ENAMEL.

SIR,—I have noticed in your issue of September 13th the remarks on the possibility of a vital reaction in the dental enamel, which were in connexion with the communication made by Mr. Evelyn Sprawson before the Royal Society. The notes regarding the work of the late Mr. Howard Mummery (*British Dental Association Journal*, May 1st, 1926) appear to me to be inaccurate, and anyone who had actually examined the slides which he prepared could not help being convinced that there was every probability of the reaction taking place to damaged enamel; and moreover, I do not think that his assertions have ever been proved to be inaccurate. Mr. Sprawson has made a distinct gain in our knowledge of the reaction of the enamel to injury, and I consider that he shows that the enamel makes an effort to repair the lesion, which is after all only what one would expect it to do. Your communication appears to me to unnecessarily adversely criticize Mr. Sprawson's work and that of the late Mr. Howard Mummery, both of whom have put forth evidence that enamel has reparative power, and I think everybody who looks carefully at the actual sections would be convinced of that fact.—I am, etc.,

Birmingham Dental Hospital, Sept. 16th. C. HOWKINS.

OCCIPITO-POSTERIOR POSITIONS.

SIR,—With regard to occipito-posterior positions among races that habitually squat, my experience is that there are as many cases in proportion among the natives of South Africa and India as among those races that adopt European or Chinese habits—that is, as regards chairs. Another popular idea is that the savage woman does not suffer in childbirth; I have found that she does, and also that the death rate in childbirth is very high among the less advanced peoples.—I am, etc.,

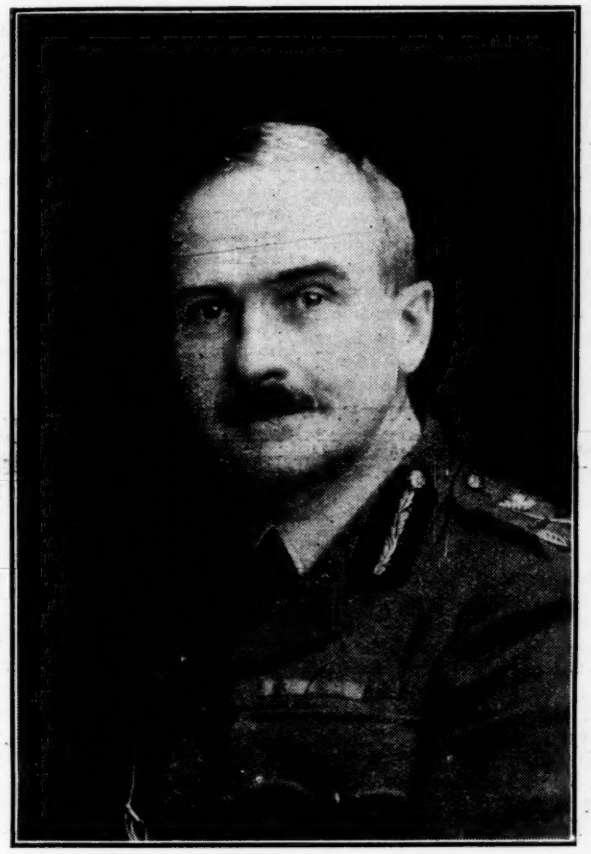
Libode, Pondoland, Aug. 21st. JOHN EVANS, M.D.

Obituary.

SIR NEVILLE HOWSE, V.C., K.C.B., K.C.M.G.,

Late Director-General Australian Army Medical Service.

MAJOR-GENERAL SIR NEVILLE REGINALD HOWSE, V.C., K.C.B., K.C.M.G., late Australian Army Medical Service, died in a nursing home in London on September 19th, aged 67. He was the second surviving son of the late Alfred Howse, M.R.C.S., of Stogursey, Somerset, was educated at Fulland's School, Taunton, and at the London Hospital, and took the M.R.C.S. in 1886 and the L.R.C.P.Lond. in 1887. Subsequently he took the F.R.C.S. in 1897, and in 1919 received an honorary F.R.C.S.Ed. After qualifying he went to Australia, where he practised for some years. In 1899 he went to South Africa with the New South Wales forces, and in July, 1900, won the Victoria Cross for going out under a heavy cross-fire and bringing in a wounded man, during the action at Vredefort. During the South African war he took part in operations in the Transvaal and Orange River Colony, including the actions at Johannesburg, Pretoria, and Diamond Hill in June, and those at Bethlehem and Wittenberg in July, 1900, and gained the Queen's medal with six clasps and the King's medal with two clasps, as well as the V.C. He left South Africa with the rank of major, and returned to Australia.



When the great war began in 1914 he was promoted to lieutenant-colonel, and accompanied the Australian Expeditionary Force, which took over German New Guinea, as principal medical officer. He then went with the First Australian Division to Egypt, being promoted to colonel and appointed A.D.M.S. to the division. In that capacity he made the medical arrangements for Anzac in Gallipoli, and for his services there was mentioned in dispatches in the *London Gazette* of August 5th, 1915, and received the C.B. In November, 1915, he was promoted to surgeon-general and director of the Australian and New Zealand Medical Services, and shortly after was made director-general of the medical services of the Australian Imperial Forces, holding that position to the end of the war. He was created K.C.B. in 1917, and K.C.M.G. in 1919. After the war he continued to hold the post of director-general of the Australian Army Medical Services till 1922, when he retired. In the same year he entered the Commonwealth House of Representatives, and subsequently held office, first as Minister for Defence and Minister for Health, and, later, as Minister for Home and Territories. He was one of the Australian representatives at the Fourth Assembly of the League of Nations.

In April, 1919, the British Medical Association held a special clinical and scientific meeting in London, the purpose being to set forth the work done during the war and to secure the presence of leaders of medical and scientific work in the forces before they returned to their civilian duties in different parts of the world. Sir Neville Howse, at that time D.M.S. Australian Imperial Forces, was a member of the general committee which organized the meeting, and took part in the proceedings. At the banquet in the Connaught Rooms, on April 10th, he responded to the toast of the Oversea Medical Services.

In 1905 he married Evelyn, eldest daughter of Mr. C. de Vial Pilcher of Newstead, Orange, and had two sons and three daughters.

The funeral service was held at All Souls' Cemetery, Kensal Rise, on September 23rd. The Bishop of New Guinea officiated, and the pall-bearers were the High Commissioner for Australia, Mr. S. M. Bruce, Sir Hugh Rigby, Mr. T. P. Dunhill, Mr. T. Trumble, and Dr. Lewis Smith. The Royal College of Surgeons of England was represented by Mr. C. H. Fagge, Vice-President, and the London Hospital Medical College by Professor William Wright.

[The photograph reproduced is by Elliott and Fry, Ltd.]

ROBERT WILLIAM MACKENNA, M.D.,

Consulting Dermatologist, Liverpool Hospital for Cancer and Skin Diseases; Dermatologist to Liverpool Royal Infirmary.

DR. R. W. MACKENNA, who died on September 21st, was a son of the Manse, having been born in Dumfries in 1874, the son of the Rev. R. MacKenna, minister of Martyrs Church. The dominating influences in his early years were clearly manifest in his later life and work.

Robert William MacKenna was educated at the Dumfries Academy and later at the Royal High School, Edinburgh, from which he passed to the University in that city, where he took the M.A. degree in 1896. Thus early he gave evidence of his wide outlook on medicine; he took part in the various undergraduate activities, and held responsible positions in many student organizations. He graduated M.B., Ch.B. in 1898, being one of the most prominent students of his year, and in 1908 proceeded M.D. At the close of his student career he visited the great medical centres on the Continent, and on his return settled in Liverpool. For some time the development of a general practice occupied his time, but he always had an interest in dermatology, and when the appropriate time came the change was made and his work became confined to this specialty.

He was appointed dermatologist to the Royal Northern Hospital, and later to the Royal Infirmary, Liverpool; he was lecturer in dermatology at the University of Liverpool, and he held also consultant positions in connexion with various other institutions. He never spared himself at work, but always gave of his best. He wrote a textbook on dermatology which is widely known. For his students, as for his patients, he could never do too much; he took a personal interest in the welfare of each one. To his patients it may truly be said that he gave his life; the conscientious thoroughness in all items of treatment which he meticulously observed, particularly in the early days of employment of remedial methods at first incompletely understood, cannot but have taken its toll of a worker whose days of leisure were few and far between.

In the war he served abroad with the rank of captain R.A.M.C.(T.F.). During this period he developed a new activity, which was to prove a most engrossing hobby to himself, as well as a source of enjoyment to a very large

circle of admirers. Always keenly interested in literature, and a ready speaker with good command of language, experience in the war stimulated him to address a larger audience than could be approached by mouth, and in his books *Adventure of Death* and *Adventure of Life* he put before the public studies which immediately made a strong appeal. He followed up these productions with a series of novels dealing with Scottish characters, and the beauty of expression, humour, and clear, brave idealism in them at once commanded success. As editor of the *Liverpool Medical Journal* he did yeoman service, and he filled with distinction many important posts in the Liverpool Medical Institution, and only his untimely death deprived him of the very highest of these. He was a member of the British Medical Association, secretary of the Section of Dermatology at the Annual Meeting in Liverpool in 1912, and vice-president of this Section at the Annual Meeting in Nottingham in 1926.

Always a keen churchman, the Scotch Church in Liverpool owes much to him; an ardent Scot, the St. Andrews and Burns Clubs will miss sorely his support and presence. He was charitable by nature, supporting many benevolent funds, and helping many acquaintances out of personal difficulties. He was a successful doctor, a dermatologist of great repute, a highly esteemed citizen, and a prominent speaker and writer. He was in the best sense of the term a doctor of the old school—a physician respected and beloved by patients, students, fellow doctors, and all who knew him.

A. D. F.

THE LATE PROFESSOR MacILWAINE.

PROFESSOR E. B. C. MAYRS (Belfast) writes:

Professor MacIlwaine's tenure of the chair of materia medica and therapeutics at the Queen's University of Belfast corresponded to a time of transition between the older teaching and the new. Soon after his appointment he visited a number of well-known universities in England and America, and made a study of their methods of teaching. He became convinced that the best foundation for the art of treatment is a thorough training in pharmacology; and he recognized the unwisdom of trying to teach advanced therapeutics to students who have as yet little clinical experience. Broad-minded, far-seeing, and free from personal ambitions, he was well fitted for the task of organizing his department to fulfil modern requirements—a task which, in spite of failing health, he carried to a successful issue.

EDMUND HENRY HOWLETT, C.B.E., F.R.C.S., who died on September 8th, was the son of General Sir Arthur Howlett, K.C.B. He received his medical education at King's College Hospital, and was house-surgeon there from 1877 to 1888, the following year being appointed assistant demonstrator of anatomy, London Hospital Medical College. He left London to take the post of resident surgical officer at the Manchester Royal Infirmary, after which, in the early eighties, he settled in Hull, where he was then the only F.R.C.S. He was appointed honorary assistant surgeon at the Hull Royal Infirmary as soon as a vacancy was made by the death of Dr. King, and in 1897 became full surgeon, retaining this position until 1914, when, in accordance with the age limit fixed by Royal Charter, he became consulting surgeon. On the discovery of *x* rays he took up their study with enthusiasm, all his spare time for several years being devoted to experimental research, in which he displayed unparalleled perseverance and patience. He was appointed radiologist to the Hull Royal Infirmary, and held this post until eight years ago, when he was succeeded by Dr. J. E. Bannen. He was a member of the board of management of the Infirmary for twenty-two years, and for a long period was chairman of the standing medical committee. For many years he was medical officer to the G.P.O. and to H.M. Prison at Hull, and at his funeral four of the warders acted as bearers. In his younger days he was an enthusiastic football player and athlete; in middle life his only relaxation seemed to be the study of *x* rays, with an occasional day's shooting; but during the past ten or fifteen years he developed his latent artistic talents and produced some excellent work in portraiture and seascape. A man of the highest integrity his character may be well summed up by saying that he was "a fine old English gentleman." He leaves a widow and two sons.

DR. WILLIAM BURTON MARSHALL, who died on August 29th, after an illness of more than a year, was born in 1881, and received his medical education at Cambridge and Liverpool. He obtained the diplomas M.R.C.S., L.R.C.P. in 1906, and graduated B.Ch. in 1908 and M.B. in 1912. After acting as house-surgeon in the gynaecological wards of Liverpool Royal Infirmary, and clinical assistant at Hoylake Lodge Asylum, he commenced general practice in Norwich in partnership with Dr. Parkinson Bush. Soon afterwards he was appointed honorary anaesthetist to the Norfolk and Norwich Eye Infirmary, and for many years he was physician to the Jenny Lind (Children's) Infirmary. He took great interest in the working of the national insurance scheme, and was for several years chairman of the Norwich Panel Committee. He was a member of the British Medical Association, and served on the Norfolk Branch Council. During the war he was at first attached to the 1st Eastern General Hospital, Cambridge; he later acted as adjutant in a hospital at Wimereux, and attained the rank of major R.A.M.C.T. He leaves a widow and two children. A colleague writes: The death of Dr. Burton Marshall will be felt as a great personal loss, not only by his relatives and friends, but also by all his colleagues and patients. He had a most lovable disposition, and was a charming companion. A well-read man, he was a fluent speaker and a versatile conversationist, full of wit, and quick at repartee.

The death took place suddenly at Nairn, on September 8th, of Dr. ROBERT MACKENZIE. Dr. Mackenzie was a native of Edinburgh, where he graduated M.B., C.M. in 1883, proceeding to the M.D. degree in 1887. He was also a Fellow of the Royal Society of Edinburgh. For a few years after graduation he practised in Edinburgh, and afterwards went to Nairn, where, at the time of his death, he had been in practice for some thirty years. The death was very sudden, and occurred on the Nairn Golf Course.

Medical News.

THE annual dinner of past and present students of University College Hospital will be held on Friday, October 17th, at 7 for 7.30 p.m., at the Hotel Victoria, Northumberland Avenue, W.C. Mr. Herbert Tilley will be in the chair. Tickets (12s. 6d.) should be obtained from the dinner secretary, University College Hospital Medical School, Gower Street, W.C.

THE formal opening of the new session at Charing Cross Hospital Medical School will take place on Saturday, October 4th, in the hospital, at 4.30 p.m.; Dr. J. M. H. MacLeod will present the prizes. At 8 p.m. that day the annual dinner of past and present students will be held at Gatti's Restaurant, with Mr. E. B. Waggett in the chair. There will be a special post-graduate course on October 4th and 5th; the programme includes clinical lectures on such subjects as minor operations in general practice, disorders of the menopause, common skin diseases, ante-natal supervision, and the diagnosis and treatment of glycosuria, renal pain, and gastric disorders.

THE presentation of medals and prizes in the University of Birmingham Faculty of Medicine will take place on Monday, October 6th, at 5 p.m., in the Medical Lecture Theatre, Edmund Street. An address to students will be given by Emeritus Professor Priestley Smith, LL.D., F.R.C.S. Tea at 4.15 in the University Club.

AT the London (Royal Free Hospital) School of Medicine for Women on Wednesday, October 1st, at 3 p.m., the prizes for the session 1929–30 will be presented, and an address will be delivered by Miss M. M. Chadburn, M.D., B.S.

THE introductory address at the University of Durham College of Medicine, Newcastle-upon-Tyne, will be given by the Bishop of Durham, visitor of the University, in the examination hall of the college, on Thursday, October 9th, at 4.15 p.m. The title of the address is "The genesis of the physician's ideal."

THE prize distribution at the Royal Dental Hospital of London, School of Dental Surgery, will be held on Thursday, October 2nd, at 8 p.m., at Leicester Square, W.C.2. Sir John Rose Bradford, P.R.C.P., will preside and give an address to the students and their friends.

DR. R. LANGDALE-KELHAM, of Roehampton Hospital, will lecture at the London (Royal Free Hospital) School of Medicine for Women on Monday, October 6th, at 5 p.m., on "Artificial limbs." The lecture is open to all graduates and clinical students of the school.

THE inaugural address at Westminster Hospital Medical School will be given in the board room of the hospital by the Rev. Dr. J. Scott Lidgett, Vice-Chancellor of the University of London, on Wednesday, October 1st, at 3 p.m., under the chairmanship of Mr. Walter G. Spencer. The annual dinner of past and present students will be held at Grosvenor House, Park Lane, on the evening of the same day at 7.30, with Dr. S. Ernest Dore in the chair.

A COURSE of ten lectures on "Contraception and allied questions" will be delivered in the lecture hall of the Royal Institute of Public Health on Thursdays at 4 p.m., from October 9th to December 11th inclusive. The lecturers include Dr. C. Killick Millard, Dr. C. P. Blacker, Dr. Maude E. Kerslake, Mr. Harold Chapple, Dr. F. J. McCann, the Rev. Dr. A. Herbert Gray, Dr. Marie C. Stopes, and Mr. Alfred Goodman. Admission is free, but is restricted to members of the medical profession and to senior medical students. Particulars of the lectures may be obtained from the secretary of the institute, 37, Russell Square, London, W.C.1.

THE course of nine lectures and demonstrations on tropical hygiene and medicine for prospective settlers, arranged by the County of London Branch of the British Red Cross Society, will begin on October 1st. Particulars may be obtained from the secretary of that branch, 27, Grosvenor Place, S.W.1.

A COURSE of lectures on the prevention of accidents, disorders, and disease will be delivered at the Royal Institute of Public Health (37, Russell Square, W.C.1) on Wednesdays at 4 o'clock, from October 15th to December 17th. The lectures are intended primarily for the fellows and members of the Institute, but others interested in medico-sociological problems are invited to attend.

THE annual general meeting of the Medical Defence Union will be held at the offices (49, Bedford Square, W.C.) on Thursday next, October 2nd, at 4.30 p.m.

THE psychological section of the Medical Women's Federation will hold its annual conference on Saturday, October 18th, at The Lawn, Lincoln.

THE annual general meeting of the Medical Sickness, Annuity, and Life Assurance Society will be held at the First Avenue Hotel, High Holborn, W.C.1, on Wednesday, October 8th, at 4.30 p.m.

THE Fellowship of Medicine announces that there will be a special post-graduate course in medicine, surgery, and the special departments at the Metropolitan Hospital from September 29th to October 11th, occupying the whole of each day from 10.30 a.m. to 5.30 p.m. There will be daily pathological demonstrations. A course in diseases of the ear, nose, and throat, to be held at the Central London Throat, Nose and Ear Hospital, Gray's Inn Road, from October 6th to 31st, will comprise clinical, operative, and pathology classes; the clinical part may be taken alone or in conjunction with one or more of the other classes. There will be a course in gynaecology at the Chelsea Hospital for Women, Arthur Street, from October 13th to 24th, consisting of lectures and demonstrations in the operating theatre. An evening course of seventeen lectures suitable for, though not restricted to, candidates for the M.R.C.P. examination will begin on October 7th, and continue on Tuesdays and Fridays, at 8.30 p.m., at the Medical Society's lecture room, Chandos Street, Cavendish Square. At the same place a course of evening demonstrations for the F.R.C.S. (final) will be given one day a week for six weeks at 8.30 p.m., including demonstrations in clinical surgery and pathology. Four demonstrators will attend each evening, and will provide two cases each. The demonstrations will begin on Wednesday, October 8th. Particulars and syllabuses of all courses may be obtained from the secretary of the Fellowship, 1, Wimpole Street, W.1.

THE London School of Hygiene and Tropical Medicine announces a course of special psychological lectures by Dr. Millais Culpin, consultant to the Industrial Health Research Board, on Mondays and Wednesdays at 3 p.m. from September 29th to October 15th inclusive. The subjects of the lectures are: importance of psychological aspects of illness; the history of medical views on psychology; nomenclature and classification; the incidence of psychological symptoms; the occupational neuroses; and theories of psychopathology. These lectures are free to members of the Public Health Service and others interested in public health work.

A POST-GRADUATE course on diseases of the nervous system will be held at the National Hospital, Queen Square, W.C.1, from October 6th to November 28th. It will consist of thirty-two clinical lectures and demonstrations at 3.30 p.m. each week-day except Wednesday and Saturday, instruction in the out-patient department at 2 p.m. on each week-day except Saturday, and eight pathological lectures and demonstrations on Mondays at 12 noon. The fee for the course will be £5 6s. A course of ten lectures on the anatomy and physiology of the nervous system will be arranged on Wednesdays and Fridays at noon if there are sufficient applicants; fee £2 2s. Twelve clinical demonstrations on methods of examination of the nervous system will be given on Tuesdays and Thursdays at 12 noon; fee £2 2s.

HEALTH WEEK in 1930 will be celebrated from October 5th to 11th, and up to the present 124 towns have undertaken to emphasize self-help in health as being the responsibility of the individual citizen. A leaflet giving particulars of the steps that may be taken to this end is obtainable from the secretary of the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1. It deals with the formation of local committees, construction of a programme, suggestions for lectures, and the various sources from which assistance can be obtained.

A CONFERENCE of the National Smoke Abatement Society is being held this week-end in Leicester from September 26th to 28th. The subjects dealt with include atmospheric pollution as affecting visibility and therefore aviation, and fuel research and smoke abatement. Among the speakers are Dr. R. Veitch Clark, medical officer of health for Manchester, and Dr. C. Killick Millard, medical officer of health for Leicester, while the president of the conference is Dr. H. A. Des Voeux.

THE August issue of the *Journal of the Cancer Research Committee of the University of Sydney* contains an account of the first conference of cancer organizations in Australia, which was held at Canberra on March 20th and 21st. Reports were received from different parts of Australia, and resolutions with reference to the establishment and conducting of radium clinics were approved. Dr. E. H. Molesworth read a paper on the relative value of the various methods of treating cancer; this is published in full in the issue just received.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

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QUERIES AND ANSWERS.

NASAL CATARRH AND HARRISON'S SULCUS.

"H. A. F. G." asks for information regarding the title and date of appearance of an article on the subject of the prevalence of rhinitis in the newly born. It was stated that in the experience of the writer half the children born became infected with rhinitis within a very few days of birth. The author of that article also advanced the view that Harrison's sulcus in rachitic children was due to the effect of nasal obstruction tending to create a negative pressure in the thorax, and thus inducing moulding of the ribs over the liver. Our correspondent thinks the article in question appeared not more than six or seven years ago

IDIOPATHIC HAEMORRHAGE IN THE NEWBORN.

DR. P. O. JOLLIE (Middlesbrough) writes: The following brief description of a case may interest your correspondents on this subject. On August 22nd I delivered a 9-para, aged 45, of a fine baby girl, who had a brisk haematemesis three hours after birth; this was repeated six times, at intervals of about twelve hours, associated with tarry motions, two of which contained fresh blood. The amount of blood lost, to use the words of one of your correspondents, was truly amazing, although I should hesitate to guess the amount. Nevertheless at no time did the child seem the worse for the haemorrhage and the exertion of the vomiting, except that it lost the "raw ham" colour peculiar to the newborn. No treatment was adopted beyond complete rest for twelve hours, and thereafter feeding with warm water flavoured with sugar. The child has had no further haemorrhage since August 25th, and is going on normally.

TECHNIQUE OF INJECTING VARICOSE VEINS.

DR. JOHN MCLAREN (Edinburgh) writes: Most of the writers in the recent correspondence on the technique of injecting varicose veins urge the importance of taking great care that the injection actually enters the vein, since otherwise sloughing may follow. One firm of chemists, on the other hand, in their directions how to conduct this treatment, give the advice that in certain circumstances injection round the vein is useful. Will someone with experience supply a definite decision on this point?

INCOME TAX.

Change in Employment.

"M.O.H." was, until November 1st, 1929, acting as a whole-time deputy and chief assistant county M.O.H. and S.M.O. at a salary of £850 per annum. Since then he has held a part-time post, with permission to do other public work, but not general practice. His total net earnings for the two years to April 5th, 1931, will be £819 and £625 respectively, as compared with £802 net in previous years.

*** In our opinion "M. O. H." is clearly entitled to treat his employment as having ceased and been restarted as from November 1st, 1929, and therefore to have his earnings for 1929–30 and 1930–31 assessed on the amount of the actual year's earnings. The matter is governed by Section 45 of the Finance Act, 1927, and the cessation or commencement relates to "an office or employment." The inspector's contention that "the nature of the employment" is unaltered is irrelevant, as there has undoubtedly been a change in the "office." If, on reconsideration, the inspector is not prepared to give way, we suggest that "M.O.H." should write to the Secretary, Inland Revenue, Somerset House.

Motor Car Expenses: Private Use.

A CORRESPONDENT has sent us a protest against a recent suggestion made in these columns that "the only satisfactory basis of allocating car expenses is the mileage basis." He encloses a statement setting out in detail various points on which such a basis would work unfairly against the practitioner, such as the greater ratio of time which professional use involves, the greater consumption of petrol, greater wear and tear on electric starter, brake parts, gears, etc., and greater damage owing to weather. We admit that our suggestion should, perhaps, have been qualified; it would have been better to have said that "the only *single* basis of allocating car expenses is the mileage basis," but we were writing without reference to a practitioner who had such records of time, approximate number of gear changes, etc., as our present correspondent is apparently able to produce, and in the absence of such information it is difficult to get away from the mileage basis. Perhaps we may add that some of the factors would not always work out as our correspondent suggests.—for instance, a practitioner who uses his car to take his family out for a Sunday might find the time factor against him if it included the hours when the car was parked; private use often involves as short trips as professional use, and during holidays the car may travel over worse or more hilly roads than those where the practice is situated. On the whole the mileage basis seems the best starting point, having regard to the importance of effecting agreement with the authorities, if possible, but we agree that other factors may well be brought in—where their applicability can be proved—to modify the result of that allocation.

LETTERS, NOTES, ETC.

THE FOOT AND THE SHOE.

"M.B., D.P.H." writes: With reference to the letter from the general secretary of the Boot Trade Associations, Ltd., published in the *Journal* of August 2nd (p. 200), may I make some suggestions as regards women's shoes. My complaint is, first, that it is impossible to purchase a ready-made shoe with anything approaching a straight inner line—that is, which will not in some measure deflect the big toe towards the middle line of the foot—and, secondly, that one cannot buy a smart, dressy shoe for a wide foot. I see no difficulty in the way of producing shoes of smart appearance, with low or with high heels, giving at the same time the very desirable straight inner line and sufficient width for the toes of wider feet. Wide-fitting shoes are invariably made heavy-looking, and with heavy, ungraceful heels. Why not provide a neat wooden heel as in other styles? Lightness is essential to comfort. That the pointed toe is not essential to smartness is shown by the fact that one of the most "dressy" styles of shoe at present on the market, that with a high Spanish heel, has a wide round toe. We may, I think, leave aside the question of the height of the heel as one which will be decided by the demand of the wearer rather than by the producer; but improvement in the customary shape of the fore part of women's shoes, the elimination of that shape which deflects the big toe, is urgent, and at the same time, I think, quite practicable. The wide, round toe is very neat, and is accepted by the dictates of fashion as compatible with a dressy effect. With more attention to the ideal of the straight inner line, and perhaps also to the necessity for sufficient length in the round-toed style, this shape should give all that can be desired in the matter of room for the toes, and should be developed as far as possible for all styles of shoes. The more or less pointed shoe, which deflects the big toe and is a prolific cause of unsightly deformity, should become a relic of the past. I write from the difficult experience of procuring shoes for wide-footed members of my own family who are not satisfied to wear "frumpy" shoes.

PREGNANCY AND CERTIFICATION.

"T. G." writes: I am in complete agreement with "H. R." (September 20th, p. 504) that some definite rule should be laid down with regard to certifying pregnancy. I am also of the opinion that no housewife should be signed on while she carries on her household duties, but only when she is confined to bed or obliged to employ a paid substitute; this last matter can be verified by the health visitors. I have found in my practice that the patients have on several occasions been told by insurance agents that they can be "signed on" if they can get a certificate from the doctor, and, of course, the good news soon spreads among a certain class of patients. I have refused to sign on several patients, and have had to suffer indirectly for my efforts to secure economy.

NURSES' FUND FOR NURSES.

THE committee of this fund, which was inaugurated by the *Nursing Times* in 1925, is in urgent need of financial support and other assistance in relieving the distress of poor, elderly, and disabled nurses and midwives. Some of these receive regular grants, chiefly to supplement their old age pensions, while others, with a bare subsistence, require help in sickness, especially during the winter months. At present the list prepared by the committee comprises over 400 names, and new applications are made every week. The poverty of aged nurses—some of whom continued to work until they were well past 70—is indicated by the fact that those who have 20s. a week are disqualified from receiving financial aid, except for special reasons. In its appeal the committee points out that if the nurses of all hospitals and institutions were to agree to deduct a penny from their monthly salaries the total amount would be sufficient to maintain its work. It has been calculated that a gift of £100 will provide 5s. a week for an old nurse for about eight years. Another object of the committee is to raise funds for the endowment of homes for retired nurses. So far accommodation has been found for twelve nurses at the Cow and Gate Home, South Side, Clapham Common, where most of the occupants are over 70 years of age. To enable this branch of its work to be carried on without anxiety, the committee estimates that an endowment fund of £2,500 is required. Besides financial support, help is requested in collecting subscriptions and in visiting and in writing to the lonely. With the exception of some clerical assistance, the services involved in distributing the fund, which include a thorough investigation into every case, are entirely voluntary. Donations and gifts of clothing, parcels, papers, etc., should be addressed to the honorary secretary of the fund, *Nursing Times*, St. Martin's Street, W.C.2.

ALLOTMENTS FOR THE UNEMPLOYED.

DR. E. B. HAZLETON (Sheffield) writes: In order to counteract the evil consequences of unemployment—namely, wasted muscles, general want of tone and loss of self-respect—a scheme for allowing unemployed men to work on allotments has been started in Sheffield with splendid results. It has been found that when a steel worker or other manual labourer had been out of work for a year or two and then returned to work the wasted muscles were unequal to the task. This is a very serious matter, but there is another aspect of the case not often thought of—that is, such a man, in a case of national emergency, would be useless for war purposes. Allotment gardening gives the man a fresh interest in life and they become physically fit.

MOTHERCRAFT.

IN *Motherhood*, an attractive booklet, of which a third edition has appeared, Messrs. Cow and Gate Limited combine sound advice on the hygiene of pregnancy and the care of the young infant with a pardonable advocacy of products of their own manufacture, and a not quite so pardonable attempt to undervalue products manufactured by others—for example, vitamin D obtained by irradiating ergosterol. Copies may be obtained (post free, 1s.) from the Medical and Research Department, Cow and Gate House, Guildford.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 42, 43, 44, 45, 46, 47, 51, and 52 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 48, 49, and 50.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *151*.

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Vide *British Medical Journal*, March 15, 1930, pp. 488-9, and 495-6, and April 5, 1930, pp. 669-70. *The Lancet*, March 15, 1930, pp. 573-4 and 587. *British Journal of Anæsthesia*, April & July, 1930. *Proceedings of the Royal Society of Medicine*, May, 1930, pp. 919-928. *British Journal of Urology*, June, 1930, pp. 129, 130 and 179.

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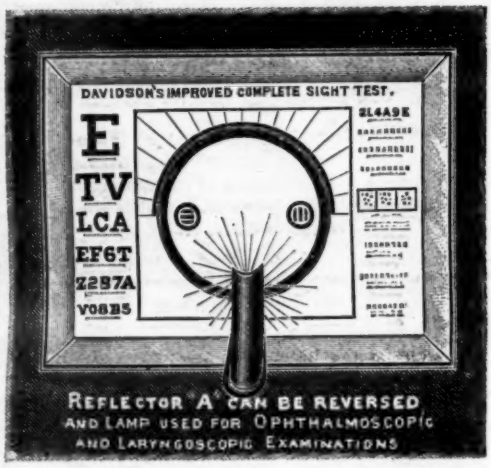

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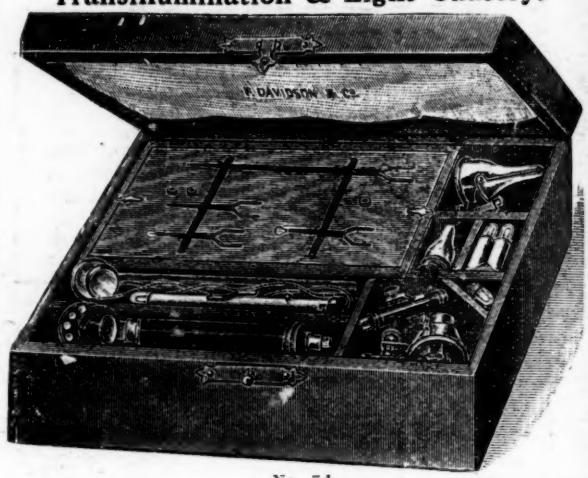

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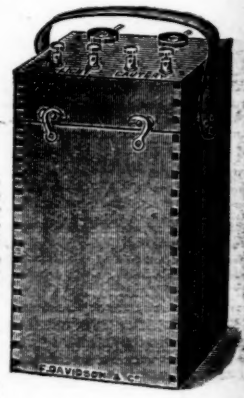

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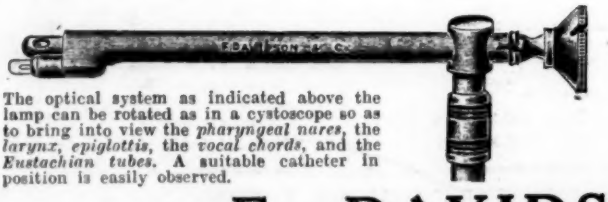

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